AMERICAN ARTISAN

IDENTIAL AIR CONDITIONING · WARM AIR HEATING · SHEET METAL CONTRACTING

n This Issue

s you might detect from picture on the right, this e of American Artisan in contains information the oil situation. To et the propaganda that been making the rounds ut fuel oil "shortages" Oil Heat Institute re- sted the American Pe- leum Institute to make a nprehensive study of the supply picture. The re- s are on Page 62.

Gas heat has gained ac- tance as a close approach automatic heating, but n its most enthusiastic porter would not deny it has its drawbacks. ong these have been tification and "cold 70". Page 76 Mr. C. L. Benn the Pittsburgh utility npany gives some sug- tions on eliminating some hese difficulties.

n these days of booming es any means of cost re- tion should be of vital rest to the alert busi- sman. A short while ago, rticle in the Sheet Metal tion cited the savings to made thru the use of umatic tools in the sheet al shop. On Page 85 are actual experiences of a et metal shop using com- ssed air.

OCTOBER, 1947

Your JOBBER does a man-sized job!

A man-sized job is right! Your jobber is working for *you* as well as for us . . . and that's money in your pocket. Your jobber carries a complete stock of C&L Lamneck furnace pipe and fittings, saving you warehousing costs. And, because he can make fast delivery, you avoid expensive delays on the job. Add up these important savings and it's easy to see why we say, "Always specify C&L LAMNECK *from your jobber!*"

Write for the new C&L Lamneck catalog today.

CLAYTON & LAMBERT MFG. CO.
1760 DIXIE HIGHWAY • LOUISVILLE 10, KY.

ACCURATELY DESIGNED FOR SPEEDY INSTALLATION

Designed for accurate fit! That's the secret of faster installation with C & L Lamneck furnace pipe and fittings. Reduce on-the-job expense with job-sized C & L Lamneck fittings.

Specify C&L Lamneck FURNACE PIPE AND FITTINGS

OTHER C&L PRODUCTS: C&L BLOW TORCHES, FIRE POTS; C&L HOFFMAN WATER HEATERS; BUCKEYE CORN CRIBS, GRAIN BINS; SILVER SHIELD SILOS

A QUARTER OF A CENTURY

Supplying

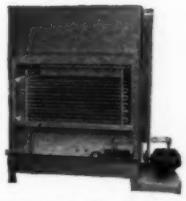
GOOD EQUIPMENT

Once you've specified USAIRCO air conditioning equipment, and experienced USAIRCO's willingness to serve you as you'd like to be, you'll gain an appreciation of the factors of its large and steady growth. Smart designing, inspired engineering, sound manufacture are valuable assets to everyone specifying, installing, and using air conditioning. USAIRCO offers you all this—plus cooperative engineering counsel in all phases of air conditioning. Depend on a name that has been growing and building for a quarter of a century.

Refrigerated Kooler-aire

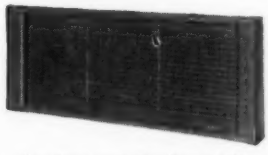
Blowers

Store Conditioners



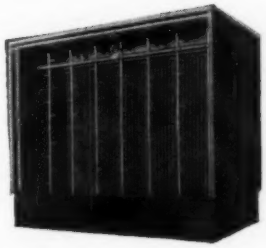
Evaporative Condensers

Unit Air Conditioners



Heating and Cooling Coils

Unit Heaters



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AMERICAN ARTISAN

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AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

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Member—Associated Business Papers

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Founded 1880

OCTOBER, 1947

Volume 116, No. 10

The Reason

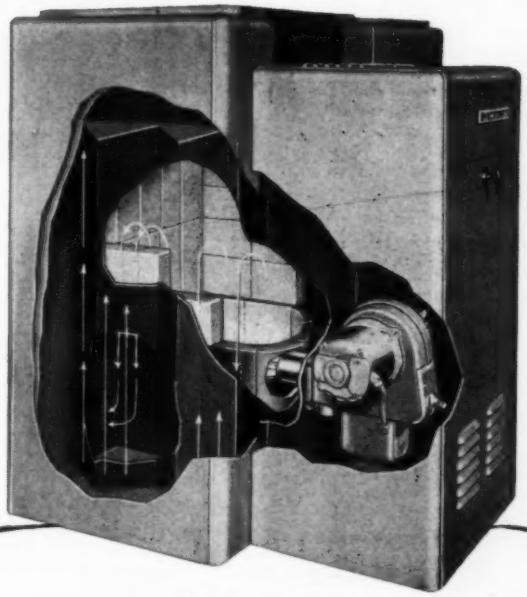
Syncromatic
COUNTER FLOW

SYNCROMATIC

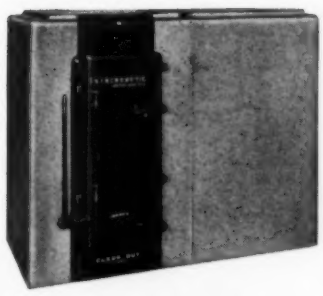
WARM-AIR FURNACES FOR COAL OIL AND GAS *Can't be Equaled*

GAS-FIRED

Beauty... Simplicity
Economy...
Efficiency



OIL-FIRED SECTION
Showing **COUNTER FLOW** *Principle*



COAL-FIRED

An Engineering Design
Only Syncromatic
Can Offer

Syncromatic Corporation
WATERTOWN, WISCONSIN

Speed

TO MEET YOUR NEED

Precision-built Sampsel controls never become "orphans". IF a Sampsel Control becomes accidentally damaged, or needs modernization after years of service, there's no need to load it onto your own busy servicemen — it's more profitable to keep them working on new installations. That's why Sampsel maintains a completely equipped Modernization Department, manned by factory craftsmen. It's at *your* service, ready to put any Sampsel-built product into "brand new" condition economically.

Service By Return Mail

Within a few hours after any Sampsel unit is received for service, a rebuilt and re-conditioned model in perfect condition is on its way back to you. This modern "Exchange" Service saves you many days, keeps your customers happy!

Complete Modernization

Where improvements in design have been made in the original model, the exchange unit returned will include new parts. Units are completely cleaned, repaired, modernized and retested individually.

Write for full information on the complete Sampsel line of precision-built automatic controls for modern home heating systems.

Sampsel
AUTOMATIC CONTROLS

SAMPSEL TIME CONTROL, INC. • Spring Valley, Illinois
CANADIAN SALES DISTRIBUTOR: PEASE FOUNDRY CO., LTD., Toronto, Can.

The Editor's NOTE BOOK

Aboard the "Harry L."

Here's Harry L. Fitch, heating contractor of Buffalo, New York, sitting aboard the good ship "Harry L."

Harry says he's deep in thought—but we're wondering if it's fishing he's thinking about.

Fishing or reading, it looks like a good place to do it—and good reading material, too!

Zone Control

American Artisan:

We recently contracted for a job that requires zone control; but, as this is comparatively new in warm air heating, we are not too familiar with it.

We thought you could help us in getting complete information on zone control.

C. H. C., Illinois.

Reply:

We are attaching to this letter the names of control manufacturers listed under "Zone Distribution" in our January 1947 Directory Section. Each manufacturer has zone control literature available describing circuits, installation and equipment.

We feel sure that if you write each of these concerns, telling them your problem, they will gladly help you.

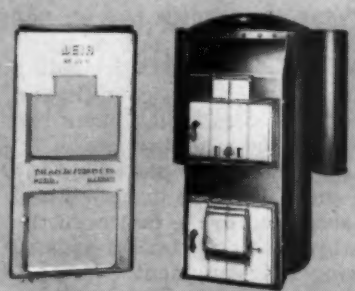
American Artisan.

they're tired of waiting

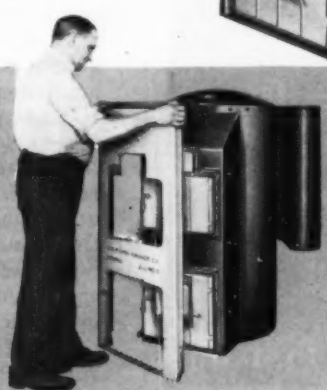
Build Profitable Furnace Sales NOW!

Shortages and restrictions on other fuels are causing thousands to install a modern coal-fired furnace *now*. Many others *must* replace obsolete heating plants yet this season. It means a longer selling season for you — and an opportunity to cash in on the *only* coal-fired furnace with Integral Heating Element.* The Weir "U" Series furnace offers the first major improvements in years. Permanently leak-proof for greater cleanliness. Never needs recementing. Simple, easy installation. Greater efficiency and finer performance gives new economy. Write for franchise details. Find out *why* "WEIR-MEYER means modern heat".

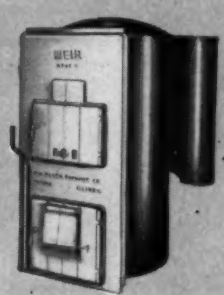
*Pat. applied for.



Integral Heating Element shipped with doors attached. Doors and seats are surface ground for perfect fit. Welded steel element is leakproof.



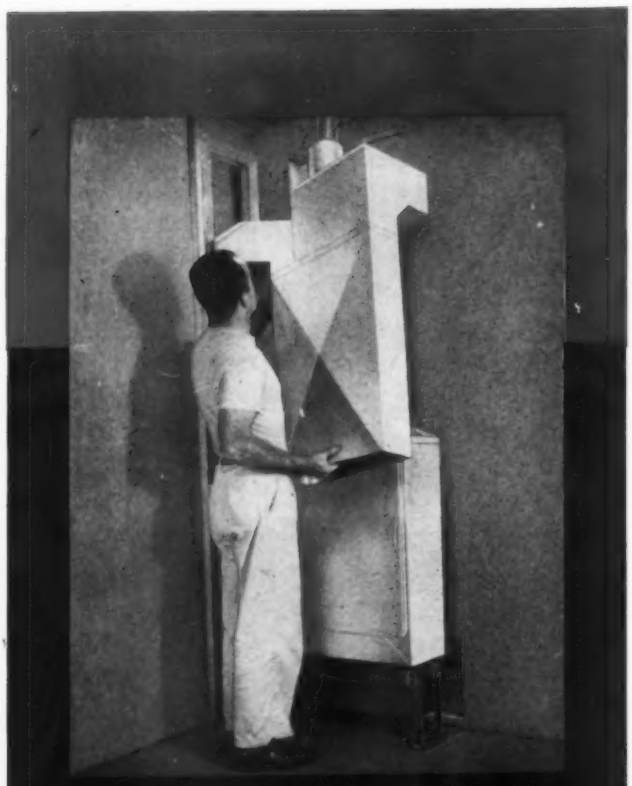
Pressed steel front slides snugly over pouch. Front is not exposed to fire. Casing hooks tightly to front excluding dirt from the air stream.



Here's the WEIR "U" Series, assembled except for casing. Installation is quick, simple and easy—saves time. Giant radiator extracts more heat.

THE MEYER FURNACE COMPANY

Offices: Peoria, Ill. • Factories: Peoria and Peru, Ill. • Mfgrs. of Weir and Meyer Furnaces; Air Conditioners for Oil, Gas, Coal



ROYAL JET-FLOW

Out-performs heating units costing three times as much

Jet-Flow is new . . . different . . . easy to sell . . . easy to install. A real profit maker . . . summer or winter. *Royal* Jet-Flow gives advantages of forced air circulation, plus ceiling radiation—truly two-way heating. Cost no more installed than conventional wall heaters or floor furnaces. Ideal for tract work.

SEND COUPON TODAY

ROYAL HEATERS INC., 1024 Westminster Ave., Alhambra Calif.

Please, send me, without obligation. Results of comparative heating tests; specifications and prices of Royal Jet-Flow.

NAME_____

ADDRESS_____

CITY_____ **ZONE**____ **STATE**_____

AA1047

The Editor's NOTE BOOK

Estimating Ductwork

American Artisan:

In the July issue of American Artisan a reader asked you for the best book on estimating ductwork and you sent him a booklet on the subject.

Can you let me have one of these booklets?

I am very interested in estimating and would appreciate it highly. I will gladly defray any expense involved.

G. J., New York.

Reply:

"Ductwork Estimating Tables" is a reprint in booklet form of data published originally in American Artisan. It has been very popular and our supply at present is completely depleted.

A revised edition is in process of preparation and will reflect current labor experience for ductwork fabrication. We plan to have the revision ready for publication by the end of the year.

American Artisan.

Automatic Heat Popularity

During a 3 day celebration in New Albany, Indiana, in honor of the 100th birthday of the Monon railroad, the Heatcraft Company of Louisville, Kentucky, set up an elaborate display of its heating equipment including gas burners, oil burners, stokers, etc. Anything "made in New Albany" was eligible to compete for the favor of the Southern Indiana folks who converged on the city for the celebration.

Here was an opportunity to learn what the average home owner is thinking about in the way of future heating equipment for the celebrants qualified as "average American" and comprised of professional men, industrialists, merchants, white collar workers, laborers and a good representation from the farming communities.

Conversion oil burners were the overwhelming choice disclosed by actual orders taken for installations in seventeen surrounding counties. Oil-fired winter air conditioning units placed second in sales, coal stokers ran third and were trailed by coal furnaces.

No particular sales effort was placed on any equipment. The entire line was displayed and orders accepted according to the desires of the purchasers. Nearby Heatcraft dealers assisted with demonstrating the equipment.

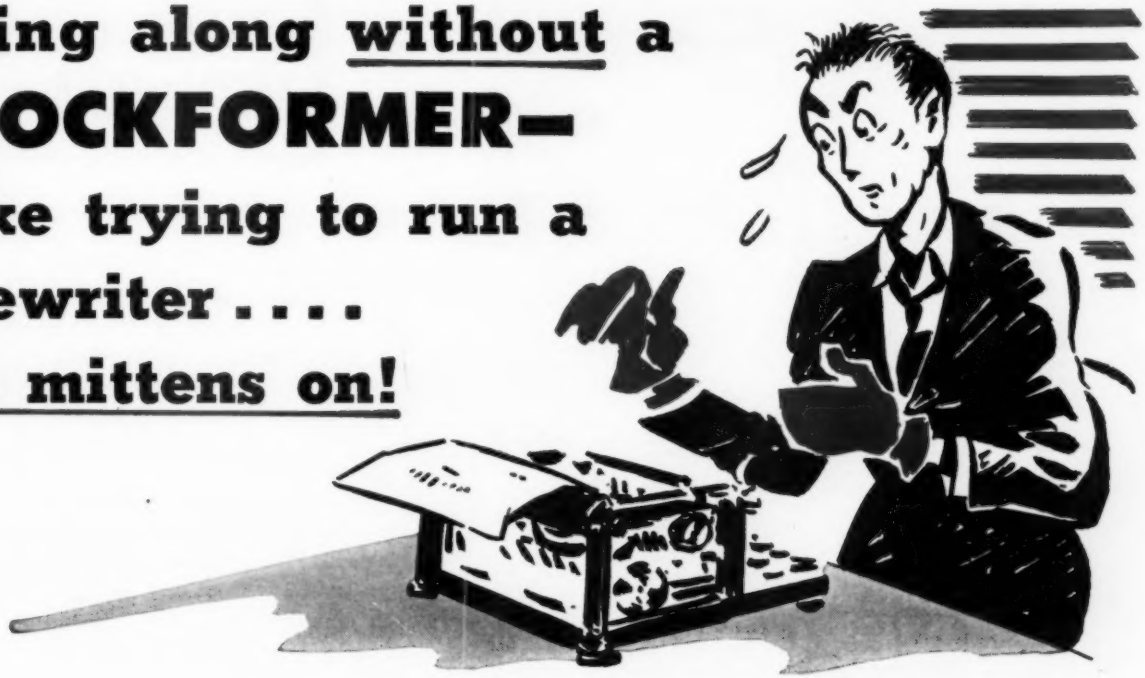
Thank You!

American Artisan:

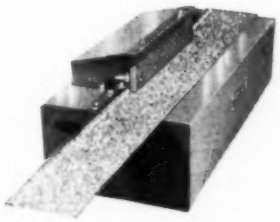
Please be so kind as to forward the Earl Goetze Company a copy of your next issue of American Artisan. The writer has impressed the members of the Goetze company that your magazine is the leading one in the heating field and have asked that they subscribe to it.

Certified Furnace Company,
St. Paul, Minn.

Getting along without a LOCKFORMER— is like trying to run a Typewriter .... with mittens on!



EVEN the best of sheet metal men can't afford to give his competition a "head start"—to work under a definite handicap and still hope to see his business grow.



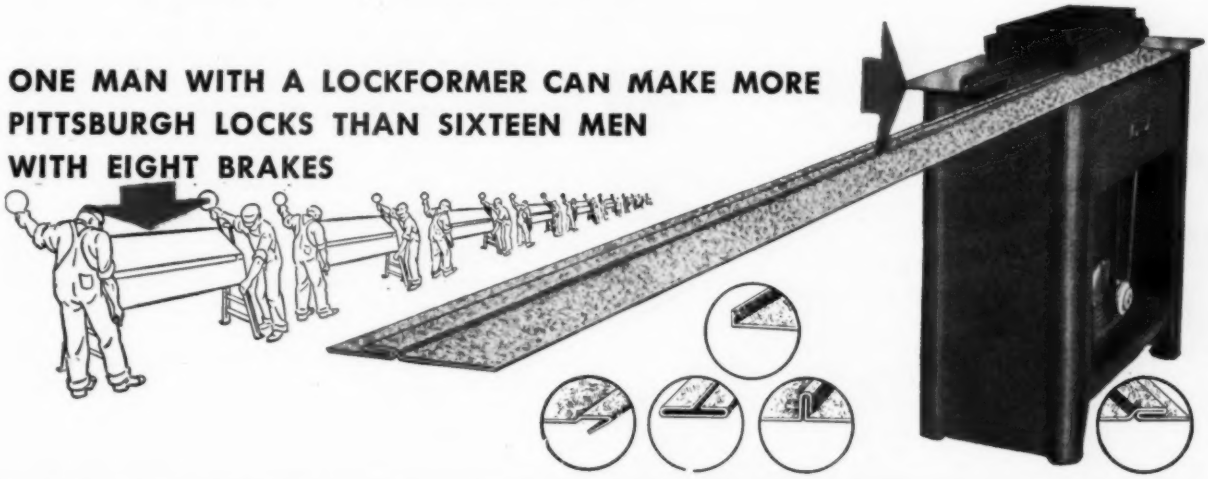
The Lockformer 24

And matching hand methods against the speed and economy of Lockformer fabrication is a handicap as big as it is unnecessary. A Lockformer cuts hand fabrication costs in half. Anybody can operate it. And, despite rising costs, you can still buy a genuine Lockformer, ready to plug in, for less than $200.

If you're really interested in making a little business into a big one . . . *take your mittens off!*

Get a Lockformer!

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES



THE LOCKFORMER CO.

4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS

FOR THE HOME

THE ASSURANCE OF DEPENDABLE SERVICE BUILT IN EVERY MERCOID CONTROL

Mercoid Automatic Controls are designed for domestic oil burners and coal stokers—also for various industrial applications requiring the control of pressure, temperature, liquid level and mechanical operation.

•

Automatic controls are entrusted with great responsibilities. Everything depends upon their unfailing performance. Therefore, the selection of automatic controls is a matter for serious consideration. ★ With this thought in mind, Mercoid Controls invite the most critical inspection and comparison in actual field service. ★ Mercoid Controls rank first for convenience of adjustment—dependable service and long life.

THE MERCOID CORPORATION
4201 Belmont Ave. Chicago 14, Ill.

FOR INDUSTRY

The Editor's NOTE BOOK

"Open for Discussion"

One of the most beneficial and interesting periods in all gatherings of our industry is the open discussion of individual technical and management problems. Sometimes discussion arises formally from the floor; sometimes informally among groups after the close of the meeting.

In the same manner, you are invited to submit your views, questions, or answers on published articles to "Open for Discussion" which appears in American Artisan from time to time.

In times like these, when revolutionary heating developments lie in the future, warm air heating contractors are inter-dependent for continued public acceptance. Individual success depends upon our industry's success.

Published discussions will be paid for at our regular manuscript rates. Address the Editor, American Artisan, 6 N. Michigan Avenue, Chicago 2, Illinois.

U. S. Living Standards

To show how high industrial output pays off in higher living standards, the World's Business Guide gives the following statistics: the United States with only 7 per cent of the world's population has 80 per cent of the automobiles in the world; 60 per cent of the telephones; 54 per cent of the refrigerators and 42 per cent of the radios. Current factory wage rates in the United States are almost double that of the next highest country, Canada, and approximately five times that of Czechoslovakia and Russia.

Our Industrial Growth

Industry's average investment per worker has risen from about $6,000 in 1939 to at least $6,600 in early 1947. To create an entirely new job, installing new machinery, etc., would cost at least an average of $8,000 today because of present higher price levels. In addition, an American factory worker uses several times the world average electrical and mechanical energy.

More productive power, more tools and machinery, plus technical know-how, has been the formula responsible for the sharp increase of our industrial output which has jumped from 23 to 50 per cent of the world total during the past 75 years.

Approved

Meaning—approved by American Gas Association and Underwriters' Laboratories, Inc.

Various Rheem Appliances carry the approvals of both these top testing authorities.

The full line of Rheem gas-fired furnaces, gas console heaters, and gas water heaters are approved by AGA. All Rheem electric appliances meet the rigid tests of U.L. Rheem oil-fired water heaters and oil console heaters also meet the safety and fire requirements of U.L.

These approvals mean top quality, safety, performance. And that's one more reason why you'll find it *easier* to sell Rheem Appliances.

There's a *complete line* of Rheem Heating Appliances, so you can more efficiently order carload assortments of merchandise.

For dealers there's the Rheem Floor-Finance Plan, which enables you to stock a full line of appliances, for only a 10% down payment.

And that's not all! Every month national advertising reaches millions of prospects—and presells them on the Rheem brand name.

For all these reasons—isn't it good business for you to sell Rheem? Mail this coupon today and find out about this profitable opportunity.

Rheem

MANUFACTURING COMPANY

All Gas Appliances are approved by the American Gas Association. All Electric Appliances are approved by the Underwriters' Laboratories, Inc.

RHEEM, Dept. R-D6
570 Lexington Avenue, New York 22, N. Y.

Please tell me more about the profitable line of Rheem appliances.

NAME .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....

GAS SHORTAGE?
OIL SHORTAGE?
REMEDIED BY

REX
AIR-PAK

With Installation of New "Gas and Oil" Heating Units Curtailed . . . and a great demand for these units still in effect, the time is ripe to modernize the gravity warm air furnaces to the "Forced Filtered Air Method". To insure complete customer satisfaction and increased profits, install the NEW and IMPROVED "REX" AIR-PAK Blower Filter Units.

A Great Factor in Fuel Conservation

With the FUEL CONSERVED in the operation of the "REX" AIR-PAK, it will pay for itself in savings resulting from more efficient operation of the furnace, and at the same time help to relieve the critical fuel shortage that faces the nation.

Air CONTROLS INC
Div. of
The Cleveland Heater Co.

2310 Superior Ave. - Cleveland 14, Ohio

The Editor's NOTE BOOK

Aluminum Sheets

American Artisan:

Please advise what success your readers have had in the use of aluminum sheets in the installation of ducts and pipe in furnace work.

We are unable to procure enough galvanized sheets to complete all of our installations.

We can get plenty of aluminum but have been wondering how it will work with galvanized steel—have been told that the two metals do not work together.

Is there any preparation that can be used to prevent this metal from corroding when used with galvanized steel?

C. A. B., Kansas.

Reply:

In the January 1947 issue of American Artisan you will find an article which describes in full detail the current practice for using aluminum in residential heating duct work. Information on handling, costs and practices is presented in this article.

Some authorities say that aluminum duct sections should not be connected to galvanized sections, nor should sheet metal screws or galvanized drive cleats be used. But, we have found that contractors are joining sections of the two metals together and they are using both black and galvanized steel hangers, cleats, etc., without bad effects.

We suspect that if the ducts are located where humidity is high, or moisture is present, it is best to avoid the use of two kinds of material, but in ordinary usage deterioration will probably be so slow that it will not be noticed.

If you care to go into this matter further, you can probably get some information by writing the Technical Service Department of Aluminum Company of America, Gulf Building, Pittsburgh, or the Reynolds Metals Company, P. O. Box 2158, Louisville 1, Ky.

American Artisan.

This—In 1947!

American Artisan:

Herewith is some trade news we believe may interest your readers.

Advertising Agency, N.Y.

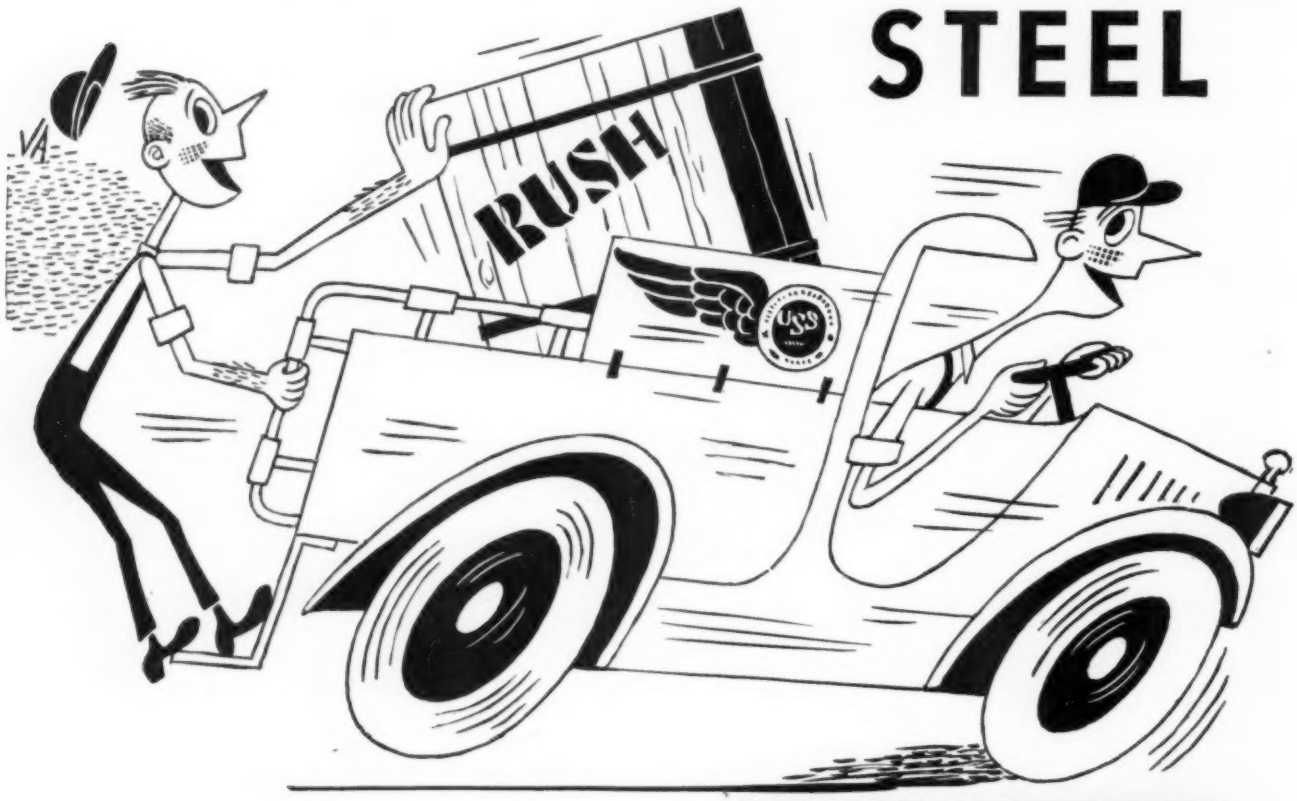
Old Manufacturers Equipping Furnaces with Oil Burners

"More and more furnace manufacturers are realizing the desirability of installing an oil burner *(in their furnaces)* and selling a complete heating unit.

"One of those to change their policy after more than 60 years is the - - - - - - - Heater Company of - - - - - - - -, Michigan, who are now offering their furnaces complete with a - - - - - - oil burner."

You don't have to sell them HEALTH!
Every home owner knows the discomforts of dry hot air. Health authorities agree that moist air prevents colds and respiratory ailments, promotes health and vigor. Every home owner wants the kind of healthful comfort that is provided only by Thermo-Drip Heat Regulated Humidifiers.
Thermo-Drip Humidifiers moisten the air as it is heated—*in direct proportion to temperature.* Thermo-Drip Humidifiers positively regulate water feed and accurately control the amount of evaporation so that the minutely correct percentage of moisture is added to the air at all times. Thermo-Drip equipped furnaces give your customers the kind of health protection that doctors approve.
Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation. Made in a variety of pan sizes for every type or make of warm air furnace. Write today for all the facts.
THERE'S A THERMO-DRIP HUMIDIFIER FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE
THERMO-DRIP
HEAT REGULATED
HUMIDIFIERS
Made by
Automatic HUMIDIFIER CO.
CEDAR FALLS . . IOWA

Trying to meet a deadline? Call us for STEEL



REGARDLESS of the kind and amount of steel you require—whether it be Stainless, High Strength or Alloy Steel, Hot Rolled or Cold Finished Bars, Structural Shapes, Plates, Sheets, Machinery, etc.,—we are anxious to serve your requirements. Telephone, telegraph or write our warehouse nearest you for quick, courteous service.

Symbol of Service

FOR STEEL USERS

UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE

UNITED STATES STEEL SUPPLY COMPANY

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BALTIMORE (3)	Bush & Wicomico Sts., P. O. Box 2036	GIlmor 3100
BOSTON	176 Lincoln St., (Allston 34), P. O. Box 42	STAdium 9400
CLEVELAND (14)	1394 East 39th St.	HEnderson 5750
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MILWAUKEE (1)	4027 West Scott St., P. O. Box 2045	MItchell 7500
NEWARK (1), N. J.	Foot of Bessemer St., P. O. Box 479	BIgelow 3-5920 REctor 2-6560—BErgen 3-1614
PITTSBURGH (12)	1281 Reedsdale St., N. S.	CEdar 7780
ST. LOUIS (3)	311 S. Sarah St., P. O. Box 27	LUcas 0440
TWIN CITY	2545 University Ave., St. Paul (4), Minn.	NEstor 7311

UNITED STATES STEEL

CENTURY DEALERS LAUNCH 3-WAY PLAN TO SAVE OIL

1 They are ADJUSTING

present installations and double-checking new jobs to get utmost efficiency.

2 They are REPLACING

outmoded and inefficient conversion burners with modern, efficient ones.

3 They are SELLING

highly efficient new furnace units to replace less efficient conversion jobs.

MODEL "R" FURNACE UNIT

Domestic water units and boiler burner units have been temporarily discontinued from our line due to material shortages.

CENTURY dealers all over America are joining to help their customers get the greatest possible amount of heat from every drop of oil they burn. It's a challenge that cannot be ignored. Oil burner dealers themselves can do much to conserve the country's oil supply. Proper adjustment and careful checking of present installations will turn in their share of the savings . . . make more new units possible without increasing fuel demands.

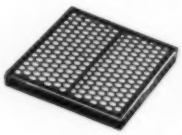
When it comes to new installations, Century's new Oil Furnace, with the patented Crescent Superheater, takes the lead in overall economy. If all the inefficient oil fired installations in the country could be replaced with burners or furnace units as efficient as Century, there would be ample fuel for everyone.

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

"Save Three Ways ON YOUR HEATING"

Planning a new Home?



HERE'S HOW TO save three ways ON YOUR HEATING

In original cost? Yes, indeed (as against other modern automatic heating systems)! In fuel consumption and operating cost? *Yes, ma'am!* Yet, these can be just the *beginning* of your savings.

Because *modern warm-air heat* is so *clean*—dust and lint being removed by efficient filters before the heated air is circulated throughout the home—walls, draperies and furnishings *stay clean*. This means less housework for you, day after day, and lower cleaning bills; means also less frequent redecorating and replacing of costly furnishings.

Efficient, thrifty, quickly responsive to changing requirements, *modern warm-air heat* is the first choice of most homebuyers today. Get the facts from your architect or builder, or from your heating contractor.

DUST-STOP *Air Filters* are standard equipment in most modern warm-air furnaces. Replacements (usually needed twice a year) are available everywhere, cost but little to buy. Owens-Corning Fiberglas Corporation, Dept. 905, Toledo 1, Ohio.

In Canada, Fiberglas Canada Ltd., Toronto, Ontario.

DUST STOP AIR FILTERS

—a FIBERGLAS product

WE'RE TELLING *Ten Million* FAMILIES IN NOVEMBER

DUST-STOP* advertising . . . *your* advertising . . . is still telling and selling the advantages of *modern warm-air heating*. It's telling and selling where it can do the most good . . . to *10 million* families vitally interested in improving their homes . . . readers of the big-circulation home service magazines.

The November DUST-STOP advertisement shown at the left is the latest in a series, adding to the *industry*-promotion and selling support that for fifteen years has consistently developed these two basic points: (1) Modern warm-air heating is "tops". (2) Regular replacement of dirty filters improves heating performance, saves fuel and money.

From *your* reactions to date, we have reason to believe *that's* good advertising. Good for the whole industry! Good for us, too. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

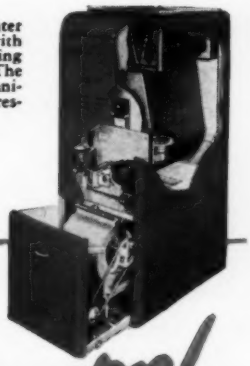
Look for these ads, YOUR ads, in

OWENS • CORNING FIBERGLAS CORPORATION

*T. M. Reg. U. S. Pat. Off.

"Your partner whose Actions speak louder than words"

The new Mueller Climatrol Type 209 Winter Air Conditioner is a compact vertical unit with the blower assembly mounted in a ball-bearing Roll-a-Drawer below the heat exchanger. The heat exchanger is streamlined to provide uniform distribution of air, minimum static pressure, and high rate of heat transfer.



NEW

Mueller Climatrol Type 209 Oil-Fired Winter Air Conditioner

gives your customers unique features for extra convenience and economy

You can mark up another "first" for Mueller Climatrol: The Roll-a-Drawer — a service unit (patent applied for) which mounts the entire blower, motor, and drive assembly on ball-bearing rollers, so that it is completely accessible for adjustment and servicing, with a flick of the wrist.

The all-welded heavy steel heat exchanger is thermodynamically designed, has *no internal baffles* to cause strains or noises, is electric-arc welded throughout, with all passageways *easily cleanable* from the front access panel.

The Type 209 Mueller Climatrol is available in three sizes, with vaporizing or pressure atomizing oil burner, and is *shipped from the factory in a completely assembled package.* Compact in size, it easily goes through any normal closet door. Filters may be installed in the bottom, either side, or the rear of the handsome, green cabinet.

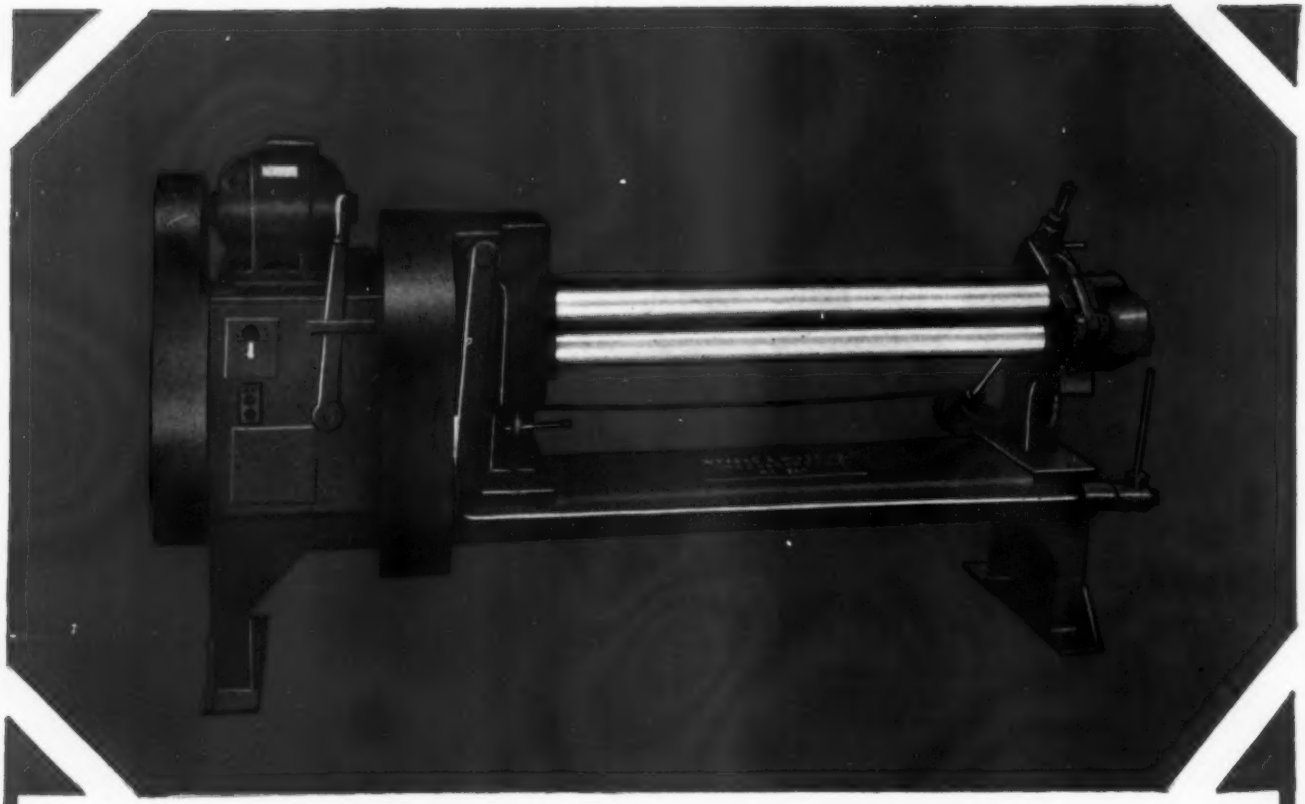
The Type 209 Mueller Climatrol sells itself to your customers and keeps them sold, by delivering the true indoor comfort of "climate control."

It really pays to capitalize on the big competitive advantage the Type 209 gives you. Sell it for new homes or to replace obsolete equipment. Write for complete information on the Type 209 today. *L. J. Mueller Furnace Company, 2010 West Oklahoma Avenue, Milwaukee, Wisconsin.*

MUELLER Climatrol

REG. U. S. PAT. OFF.

D-77



POWER BENDING ROLL FOR HIGH PRODUCTION

A MASSIVE and highly efficient Power Bending Roll for forming cylindrical shapes, capacity 5/32" mild steel. Positive locking mechanism . . . convenient and quick-acting device for lifting upper roll. Longitudinal grooves for forming small diameters in a single pass . . . gears are in proper mesh for all settings. 5 HP motor with easily accessible reversing and magnetic switches. Wysong & Miles 100% jig and fixture construction is your guarantee of uniformly superior machines.

Made in three sizes . . . No. 872-PR, 72" working length, No. 860-PR, 60" working length and No. 848-PR, 48" working length. Machines equipped with 5" diameter rolls with all rolls driven. Write for detailed information.

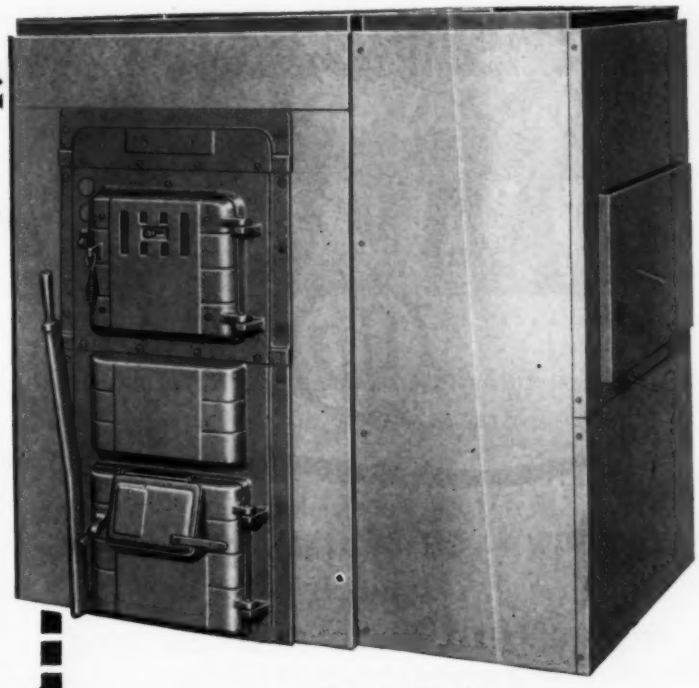
WYSONG and MILES Co.

GREENSBORO, NORTH CAROLINA

DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

Luxaire adds another PROFIT MAKER for YOU

DESIGNED FOR COAL EASILY CONVERTED FOR Oil, Gas or Stoker



Series No. AC 700-F

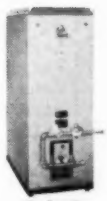
● The completeness of the Luxaire line is further enhanced by a new, steel air conditioning unit with which you can meet profitably any fuel restriction or regulation.

The unique design and construction of the compact enameled steel cabinet permit assembly of the full height blower compartment to either the left or right side.

Advanced engineering and construction of the gas tight steel heating element with die formed radiator and automatic, submerged arc welding of seams, the large area of heating surface and the long fire travel, make the Luxaire shown above the kind of unit that is satisfactorily converted to oil, gas or stoker firing.

The large, silently operating blower with rubber cushioned motor . . . large area, long lived filters, and automatic humidifier assure an abundance of clean, humidified circulating air.

Series A
Gas-Fired, Steel
Air Conditioning Unit



Series G
Gas-Fired, Steel
Gravity Furnace

Series H
Gas-Fired, Utility Steel
Air Conditioning Unit

Series O
Oil-Fired, Steel
Air Conditioning Unit

Series AC-700
Coal-Fired, Steel
Air Conditioning Unit

Series 700
Coal-Fired, Steel
Gravity Furnace

Series C
Coal-Fired, Cast
Gravity Furnace

Series VG
Oil Fired, Steel
Gravity Furnace

Series VA
Oil Fired, Steel
Air Conditioning Unit

Series VH
Oil Fired, Steel
Utility Air Conditioning Unit

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS

Another A-P First!

You Saw it at the Heating Show in January

IT'S REFINED, FIELD PROVEN AND IN PRODUCTION NOW!

New UNAPAC

UNAPAC makes the modern Vaporizing Oil Burning Furnace the Most Completely Automatic Heating Equipment On The Market . . .

Beautifully streamlined, amazingly compact, the UNAPAC, operating through its sensitive room thermostat, meters oil to the burner through the efficient "Magic Pilot" control; controls plenum chamber temperature; actuates furnace blower fan; and, through the A-P Auto-Air Unit, accurately *modulates* draft to the burner for proper air flow balance *at all burner positions* (not just one or two positions). Separate switch for summer air circulation is readily accessible; and manual operation is provided in case of current failure.

BE FIRST WITH THE LATEST—Install UNAPAC on your furnaces —for greater eye-appeal and sales-appeal.

Completely Controls EVERY Function of the Vaporizing Oil Burning Furnace

COMBINES THESE CONTROL FUNCTIONS IN ONE COMPACT, SIMPLIFIED UNIT —

- ★ Thermostatic Temperature Control
- ★ "Magic Pilot" Oil Control
- ★ Limit Control
- ★ Blower Control
- ★ "Modulating" Draft Control
- ★ Summer Air Circulation

Simple to Install

The UNAPAC has only *three* mounting holes (no mounting brackets required). Even an amateur can mount it quickly, for there is only ONE way it can be put on the furnace. Then it merely requires inserting bulb in the plenum chamber, and connection to power line and low voltage wires (for thermostat). This simplicity highly recommends it for use *where shipping furnaces "knocked down"* — for space and cost savings in transportation — and is vitally important both in factory assembly and in field installations.

● The UNAPAC is also easier to inspect and service. Removing the streamlined cover requires loosening a *single* screw, exposing the entire control system. Oil Control is readily accessible, and if special control setting is necessary in the field, the "Magic Pilot" oil control can be easily taken out of the UNAPAC mounting and another control of desired flow capacity inserted in a matter of minutes, without disturbing wiring details.

Write **FOR DETAILS**

AUTOMATIC PRODUCTS COMPANY

2452 North Thirty-Second Street • Milwaukee 10, Wisconsin

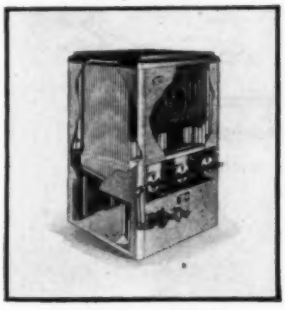
DEPENDABLE *Oil Controls*

DESIGNED TO ELIMINATE SERVICING

New RYBOLT *Units*
IN STEEL AND CAST IRON

Rybolt Series 15
Cast Iron Coal Fired
Gravity Furnace

Rybolt Series RH 71
Steel Coal-Fired
Gravity Furnace



Rybolt Series RG 53
Cast Gas-Fired
Gravity Furnace

Rybolt Series RG 54
Cast Gas-Fired
Winter Air Conditioner

These RYBOLT heating units in steel and cast iron, fired by coal and gas, represent a line that will give the dealer a big advantage in securing his share of the heating business.

With one exception these units are completely new with advanced features that are sound and practical yet register a soaring high in modern heating engineering development—compact, efficient, dependable and economical.

Series 15 RYBOLT cast iron, coal fired furnace retains the fundamental features that has made this standby famous. Yet to this model also have been added important new improvements and refinements that make it a decidedly better and more saleable furnace to meet the requirements of a more competitive market.

The dealer with the RYBOLT line today can talk quality with a new emphasis. He has what it takes to meet the requirements of the consumer who has been educated to expect more value in home heating equipment.

There's a big market ahead for dependable home heating units. Send in your order now to make sure of having ample stock on hand.

MEMBER
NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT

Rybolt Series RG 52
Steel Gas-Fired
Winter Air Conditioner

Rybolt Series RG 51
Steel Gas-Fired
Gravity Furnace

Rybolt Series 151
Cast Coal-Fired
Winter Air Conditioner

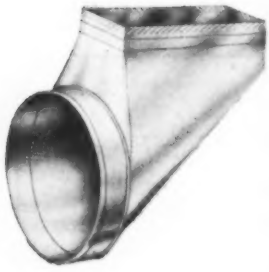
Rybolt Series RH 76
Steel Coal-Fired
Winter Air Conditioner

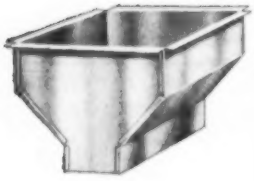
rh

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ **ASHLAND, OHIO**

Showing just a few Char-Gale fittings





CHAR-GALE ALUMINUM *Fittings*

THE ANSWER TO SUCCESSFUL AND PROFITABLE FURNACE INSTALLATION . . . . . .

Feather Light

The easiest handling fittings ever made! Cut strain and time on installations—cut transportation time and cost—cut handling time on the job.

Stronger - Longer Lasting

Rustproof clear through! Installations are stronger with aluminum—last years longer.

Better Looking

More customer satisfaction! The smooth, bright beauty of these fittings does not discolor with heat or time. Needs no painting or covering—just naturally beautiful.

And It Costs No More!

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

CHAR-GALE

MINNEAPOLIS
OMAHA

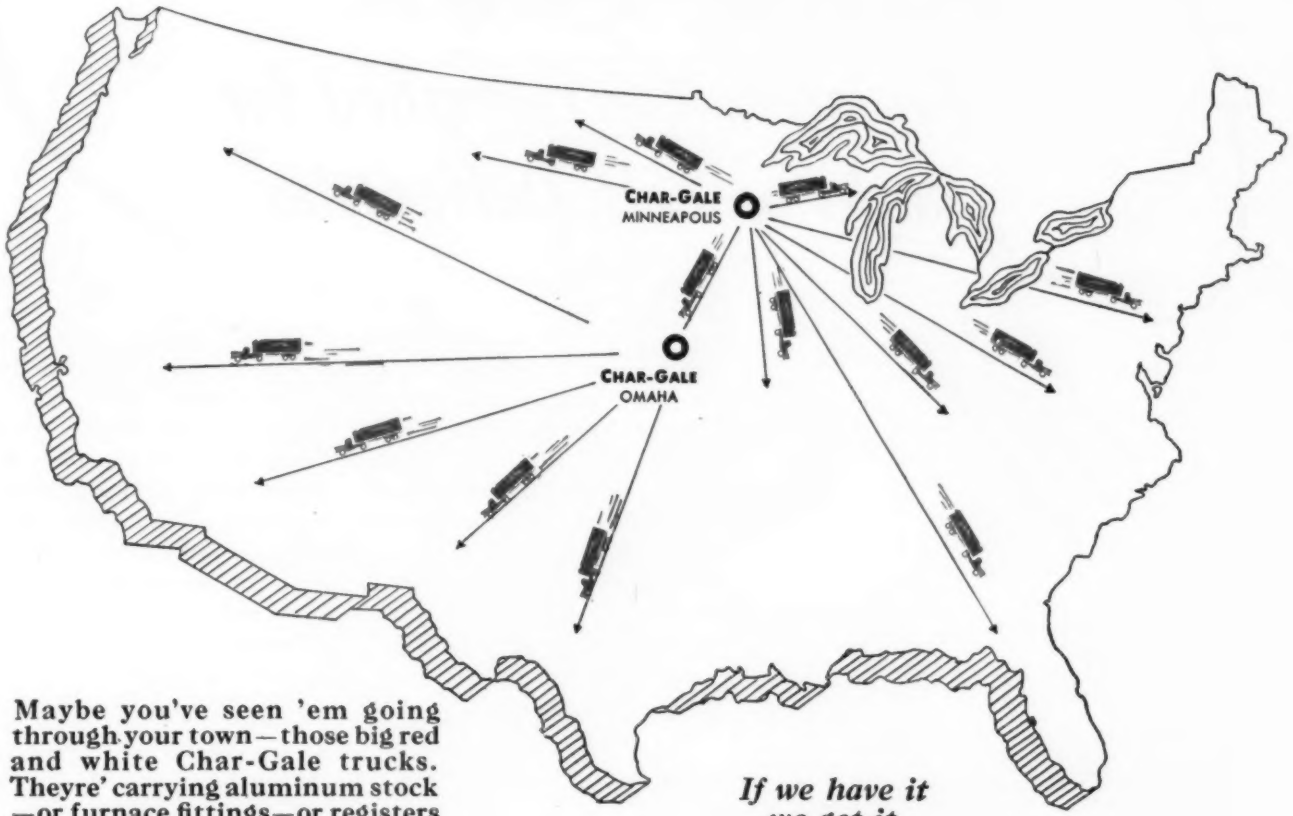
ANOTHER PRODUCT OF CHAR-GALE METAL CRAFTSMEN

* *"NO HEATING PLANT IS BETTER THAN ITS INSTALLATION — NO INSTALLATION CAN BE BETTER THAN ONE OF CHAR-GALE FITTINGS"*

FAST-DIRECT DELIVERY

CHAR-GALE

Aluminum Coils and Sheets • Aluminum Furnace Fittings • Registers



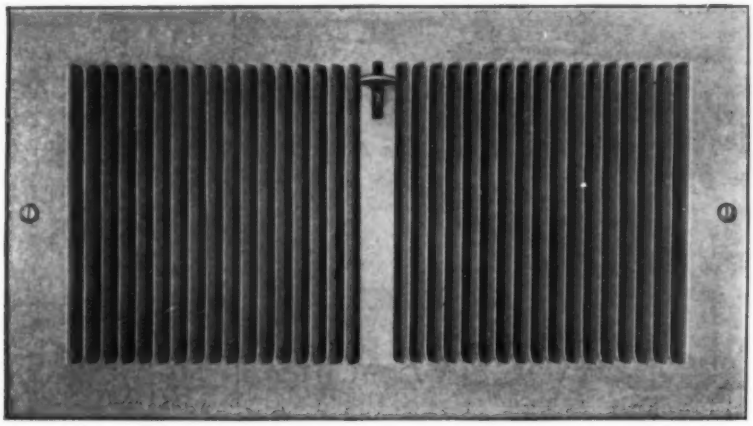
Maybe you've seen 'em going through your town—those big red and white Char-Gale trucks. Theyre' carrying aluminum stock—or furnace fittings—or registers to customers all over the nation from our headquarters in Minneapolis or our other plant in Omaha.

If we have it —we get it to you, fast!

We can furnish you with aluminum fittings or registers—products of Char-Gale metal craftsmen—or with .020 or .025 gauge aluminum stock in rolls or sheets at the lowest prices for stock in history.

Write, Wire or Phone

MINNEAPOLIS **CHAR-GALE MFG. CO.** OMAHA

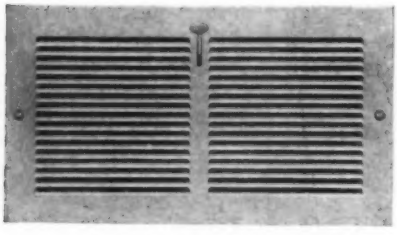


Auer "4000" Series Adjustable

AIRO-FLEX

Registers Now Furnished for Right or Left Deflection

Airo-Flex "7000" Series has horizontal fins with up or down deflection.



Here is a new series in the Auer air conditioning line, giving you this popular design with vertical adjustable fins, for *sideway* directional flow. Where single or 2-way lateral deflection is desired, this fine quality *economy* model, in appearance and efficiency, equals many more expensive registers. The single louvre is operated by a special, patented spring tension device, permanently positive. Fins are bendable on the job (set when shipped at about 22°, half left, half right). The "4000" is exceptionally neat, substantial in construction, smoothly formed and finished—a credit to any job. Supplied in usual wall or baseboard types, also intakes.

Auer offers a complete line of modern and attractive floor, base, and wall registers and return faces, for gravity or air conditioning systems—including all air directional types. We also make flat metal grilles for ventilation, concealment, or other purposes.

Ask for Auer Register Book—or Special Grille Catalog!

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS
& GRILLES *for* AIR CONDITIONING & GRAVITY

FIRST....

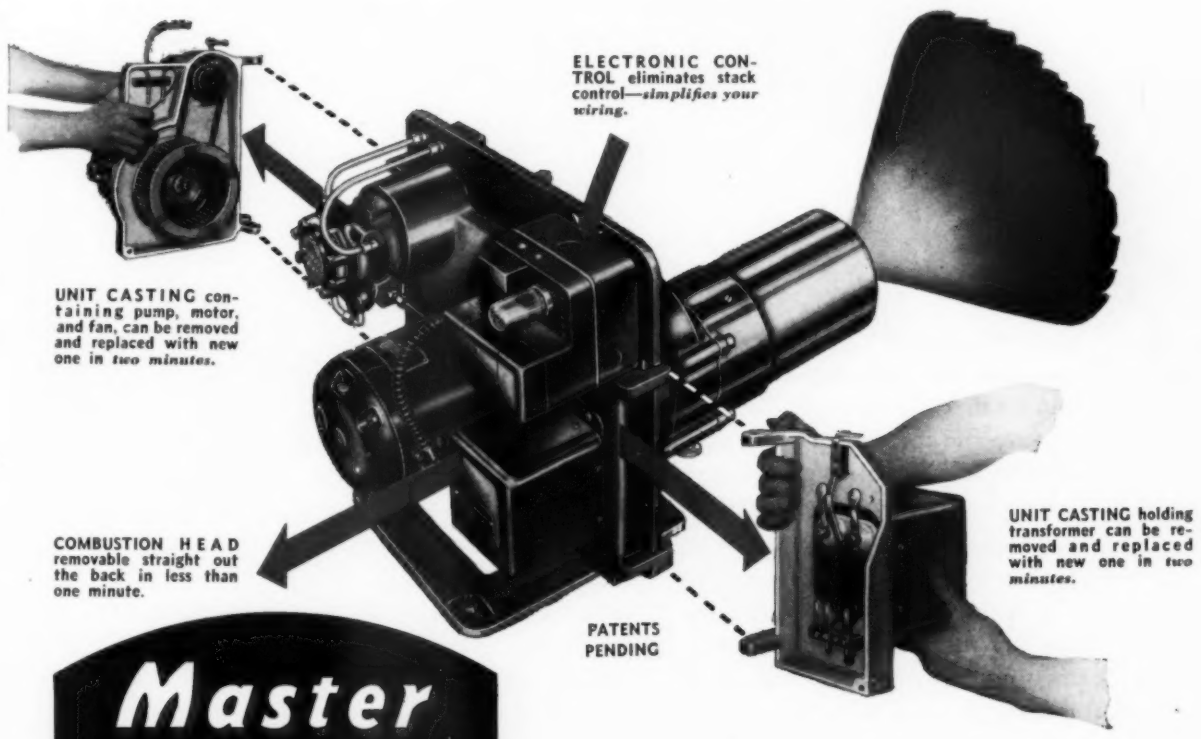
IN THE FIELD WITH *NEW* DESIGN

FIRST with the electronic control—to give split second safety in operation. The first major oil burner manufacturer to adopt the Minneapolis Honeywell Electronic Protectorelay as standard equipment.

FIRST with a new idea in burner construction to make service operations quick, easy, and simple. See quick-change service units, below. Patents Pending.

FIRST with a new principle in combustion to make this new kind of oil burner outperform all competition . . . in high CO_2, lower stack temperature, higher evaporation, higher over-all efficiency. (The Dual-Oxenizer, Patents Pending.)

You can sweep away all competition—double your sales—reap big profits with this fast selling line of oil heating equipment. Be first with the best. For details mail the coupon below.


ELECTRONIC CONTROL eliminates stack control—*simplifies your wiring.*
UNIT CASTING containing pump, motor, and fan, can be removed and replaced with new one in *two minutes.*
COMBUSTION HEAD removable straight out the back in less than one minute.
PATENTS PENDING
UNIT CASTING holding transformer can be removed and replaced with new one in *two minutes.*

Master Kraft

OIL HEAT

MANUFACTURED BY

HARVEY-WHIPPLE, INC.

SPRINGFIELD — MASS.

HARVEY-WHIPPLE, INC.
Dept. AA-10
Springfield 1, Mass.
Gentlemen:
Please send me information about a Master Kraft franchise.

NAME.....

ADDRESS..... STATE.....

CITY.....

CONTROLS

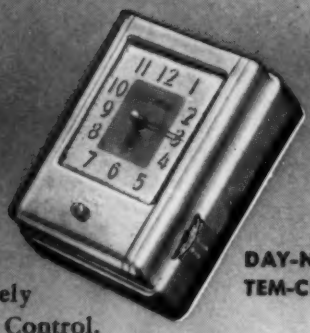
that lead the parade!

TEMTROL

STACK SWITCH

STOKER TIMER

COMBINATION FAN AND LIMIT CONTROL

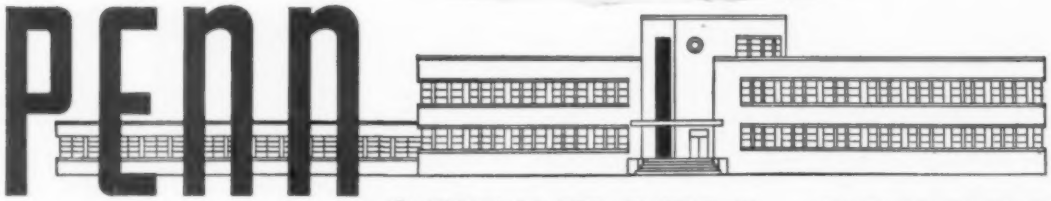


DAY-NITE TEM-CLOCK

• Specify PENN Controls . . . and you can be sure of the best automatic heating controls that can be built. *Yet their extra value involves no extra cost.* They are designed, built and thoroughly tested to assure added efficiency, accuracy and dependability.

PENN's complete line provides a control for every type of heating job . . . every kind of system. It includes PENN Temtrol, the heat-anticipating thermostat which assures true heating comfort by keeping room temperatures extremely close to the selected level. There's PENN Tem-Clock, with its economy and convenience of completely automatic Day-Nite Control.

In addition, this famous line includes the other necessary controls for automatic heating systems . . . primary controls, limit switches and relays. Specify PENN heating controls . . . it's the smart way to insure customer satisfaction. Ask your jobber about them today. Penn Electric Switch Co., Goshen, Ind. Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ont.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

HOUSING and HEATING the FACE of the NATION!

Bradford Homes, Inc., builds TWO "Quantity plus Quality" Homes in Evansville daily!

... with MOR-SUN Pressed Steel Forced Warm Air Furnaces assigned to do the heating job!

Quality need not be expensive — and it isn't when operative builders like Bradford Homes, Inc., get on the job.

In the first 13 months, Bradford Homes built 350 houses in Evansville — and now they're handing the keys to two Vets per day.

And every house is a quality house — heated by the famous Mor-Sun U-4-G furnace, the #1 furnace on America's heat parade!

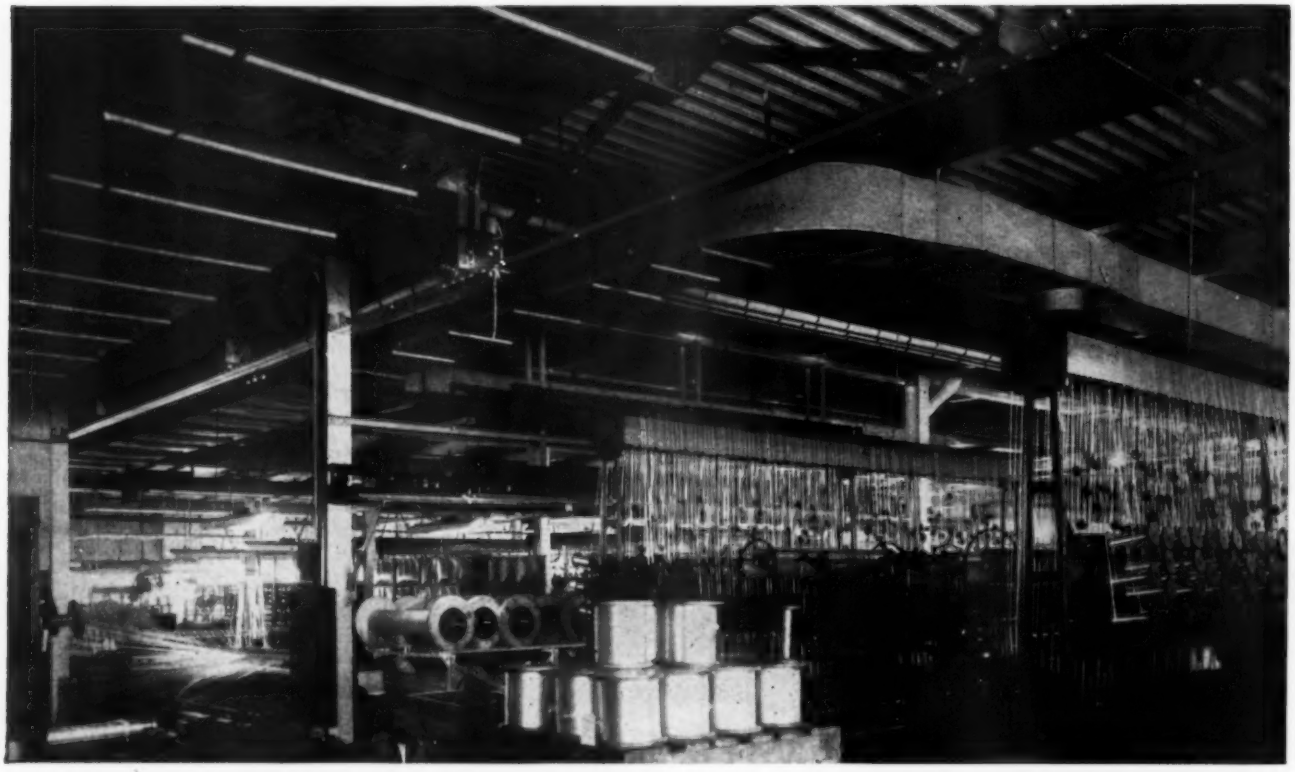
Congratulations, Bradford Homes, Inc. — Mor-Sun is proud to be a part of your project!

MOR-SUN

MORRISON STEEL PRODUCTS, INC. BUFFALO 7, N. Y.

"The Sun Never Sets with MOR-SUN"

Weaving Mills run smoother
IN CONDITIONED AIR



Ducts of Beth-Cu-Loy galvanized sheets distribute conditioned air in this weaving mill of the Narricot Company, Philadelphia.

Temperature and humidity of the air have considerable effect on production of fabrics in the high-speed looms used by modern weaving mills.

Sudden changes in atmosphere can reduce the output of these intricate machines and affect the quality of finished textiles. When moisture content and temperature are not held to set limits, yarns may become either hard and heavy or wild and brittle. If yarns are to flow smoothly, air must be controlled at all times. For this reason weavers of synthetic and natural-fibre fabrics are turning to air-conditioning to an ever-increasing extent.

Also, many concerns in other types of industries, including chemical, plastic, food, tobacco, paper and printing, are in better competitive positions today because of the advantages that air-conditioning affords.

Ductwork, to handle conditioned air takes top-quality galvanized steel sheets. Beth-Cu-Loy copper-bearing galvanized sheets resist corrosion. They are easy to work. They are reasonably priced. Beth-Cu-Loy sheets are the Number 1 choice of many sheet-metal contractors who specialize in this field.

Whenever you think of industrial air-conditioning, think of Beth-Cu-Loy Galvanized sheets. They go together.

Beth-Cu-Loy
GALVANIZED
Steel Sheets

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★

MODELS
MODELS
MODELS...
3,800,000

DOWN TO

52,500 Btu AT BONNET

THE J & C LINE*

MODEL	Btu @ BONNET
G2-70	52,500
OL3-85	85,000
G5-130	104,000
AL590	106,000
MF15	120,000
CO150	150,000
CO195	195,000
MF30	240,000
MF48	350,000
MF63	500,000
MF1000	800,000
CC2500	2,000,000
CC4750	3,800,000

*Above are representative models in the J & C line that includes more than 100 types and sizes.

MEAN MONEY TO THE MAN WITH THE MERCHANDISE

SELL..AMERICA'S LARGEST **and most complete** warm air heating line . . . J & C makes heating supply easy.

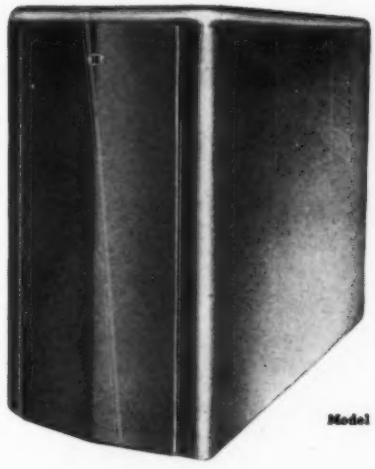
J & C's **over 100 models** . . . . . **insures against fuel shortages and gets you in on more of the heating business.** There are models for your favorite fuel.

J & C's . . . **PoweRated series gets more sales for you because** . . . units are designed TO-FIT-THE-JOB . . . **provide specified Btu output to meet BIG REQUIREMENTS,** and are ideal for drying and processing.

WHEN YOU SPECIFY

J&C

THERE IS NO SUBSTITUTE



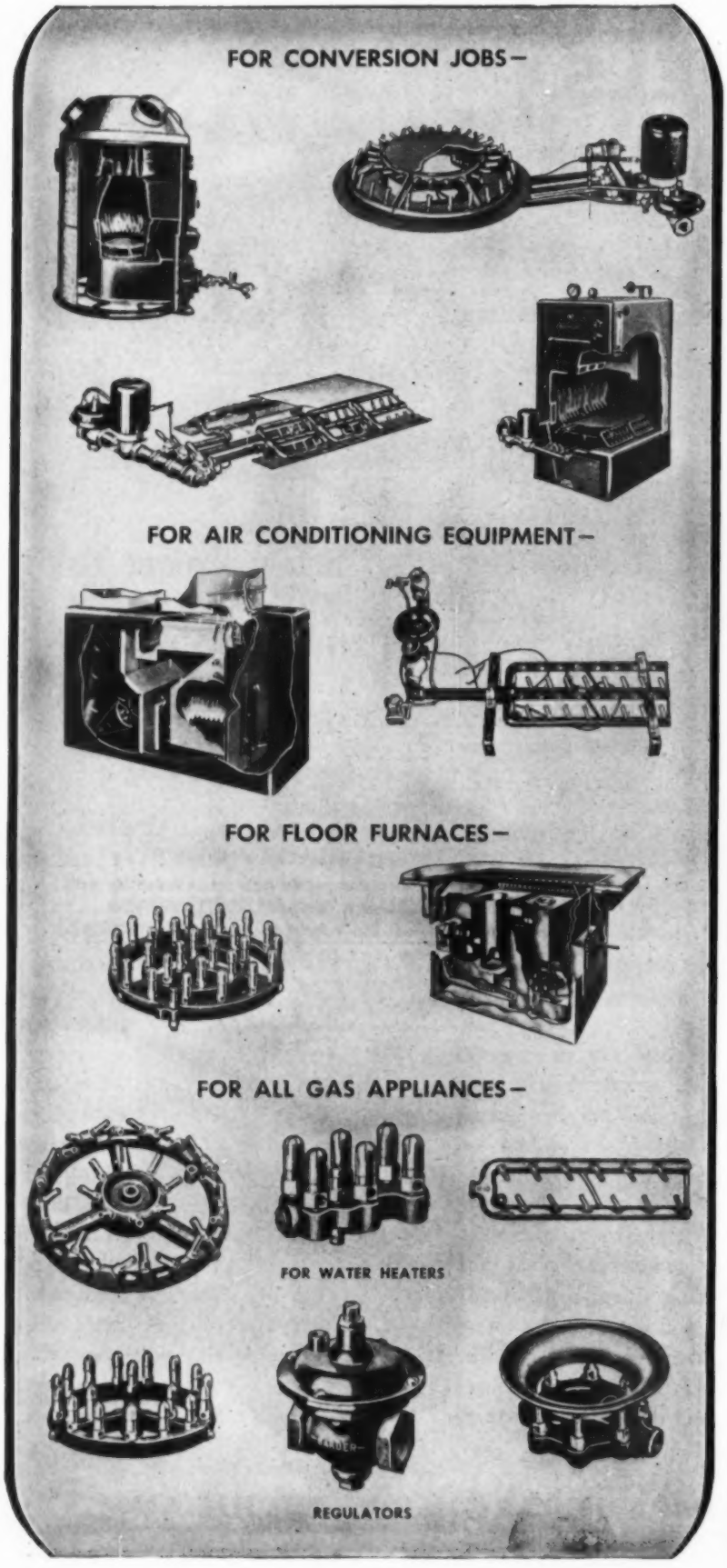
Model 1925E

A PRODUCT OF J&C

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN

MEMBER INDOOR COMFORT

BARBER BURNER UNITS



Give High Efficiency On Any Gas Appliance

Barber not only makes many types of burner units for hundreds of gas appliance manufacturers, but also acts as a source of basic engineering assistance, and a testing laboratory for the design and development of all these burners. Starting from scratch, Barber will design and then build the proper unit—in shape, size, jets, fuel capacity, and any special features—to suit any individual appliance. Merely burning gas is far different from expert combustion engineering, both in cost and in results. Barber offers you, for appliances operated on natural, manufactured, Butane or bottled gases, the most efficient and finest performing burner units available.

For conversion purposes, Barber automatic burners are made in shapes and capacities to fit the heating needs of all types and sizes of furnaces and boilers. Outstanding for 30 years, they entirely outclass most competitive experimental burners, mainly because of their superior combustion principle, which employs the patented Barber Impinged Jet. There simply is no comparison between the average mixer-type gas burner and the Barber vacuum pre-mixture design. For satisfactory performance, equip your conversion jobs with genuine Barber units.

Listed in A.G.A. Directory of Approved Appliances. Ask for new Catalog and prices on conversion burners, appliance burners, and pressure regulators.

THE BARBER GAS BURNER CO.
3704 Superior Avenue Cleveland 14, Ohio

BARBER
Automatic JET GAS
BURNERS

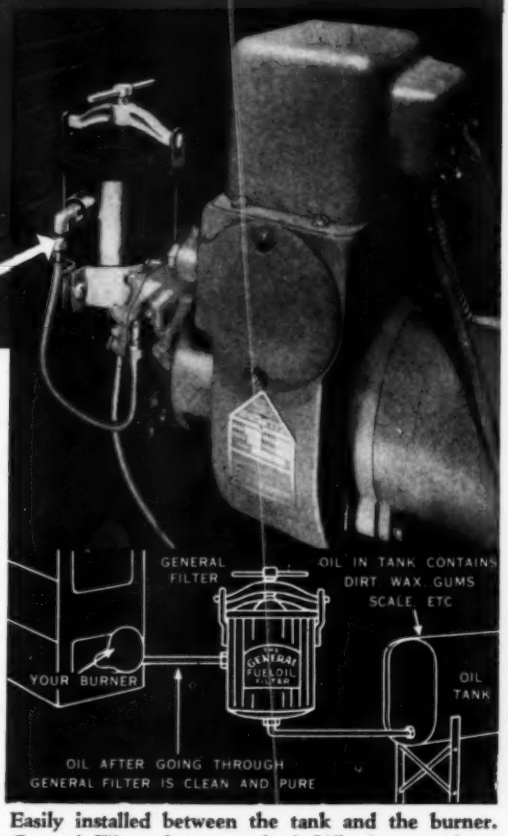
INCREASE YOUR SERVICE VOLUME

DELUXE MODEL 2A-300 JUMBO SIZE FOR LARGE SYSTEMS AND DIRTY TANKS

MASTER MODEL 2A-700 ADEQUATE CAPACITY FOR AVERAGE SIZE AND LARGE HOMES

STANDARD MODEL 1A-25 IDEAL FOR SMALL HOMES, SPACE HEATERS AND HOT WATER HEATERS

WITH INSTALLATIONS *LIKE THIS*


GENERAL FILTER
OIL IN TANK CONTAINS DIRT, WAX, GUMS SCALE, ETC
YOUR BURNER
OIL TANK
OIL AFTER GOING THROUGH GENERAL FILTER IS CLEAN AND PURE

Easily installed between the tank and the burner. General Filters have standard ⅜" pipe openings.

Choose from these three fuel oil filters when you recommend one to your customers. You will have made a life-long friend of your customer and a neat profit for yourself. There is a repeat profit to be made also through the periodic installation of a new cartridge.

The *General's* tremendous popularity with contractors, dealers, and fuel oil service companies is due to its proven reputation as the leader. Hundreds of letters will testify to their merit as the outstanding fuel oil filter for heating plants, hot water heaters, and room heaters.

There is no better time than *now* to get acquainted with General Fuel Oil Filters. Contact your nearest jobber listed below or write direct to the factory for prices, discounts, and other information.

*LISTED UNDER RE-EXAMINATION SERVICE OF UNDERWRITERS' LABORATORIES

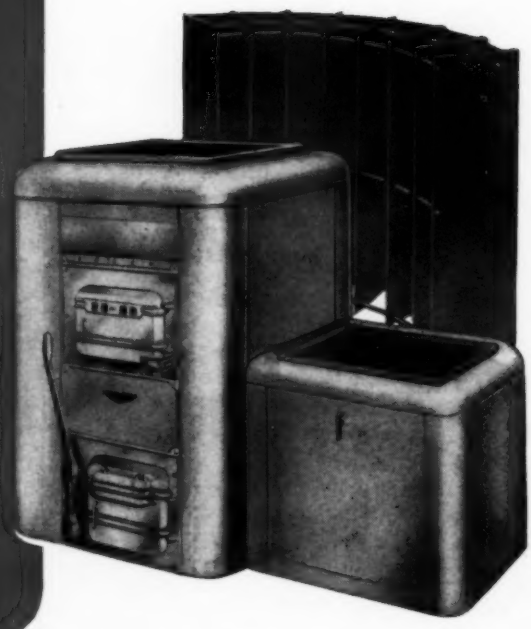
GENERAL FILTERS INCORPORATED **GENERAL FUEL OIL FILTER** 12890 WESTWOOD AVE. DETROIT 23, MICHIGAN

CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, 173 STRACHAN AVE. • TORONTO 10, ONTARIO

FACTORY REPRESENTATIVES: WILLIAM B. FORREST, Detroit, Mich.; WILLIAM J. DEBLER & SONS, Newark, N. J., Philadelphia, Pa., Brookline, Mass.; V. B. KATHE, Vancouver, Wash.; W. V. NUTTALL COMPANY, Salt Lake City, Utah; B. E. HOWENSTEIN, St. Louis, Mo.; L. E. SCHULEIN COMPANY, Chicago, Illinois; GRANSE CORPORATION, St. Paul, Minn.; RICHARD BARTHELMESS SALES COMPANY, Jacksonville, Fla.; T. C. FRENCH COMPANY, Akron, Ohio; A. G. ALLEN COMPANY, Indianapolis, Ind.; JEFF A. HEDDEN COMPANY, Atlanta, Georgia.

. . . There's a

VICTOR FIN FURNACE FOR Every Heating Job!



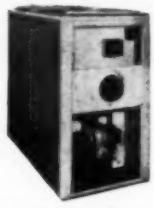
for Homes, Apartments, Factories, Stores

Regardless of whether your prospect owns a cottage, a large home, an apartment building, store or a factory—there's a VICTOR FIN furnace *built to do that job!* Since 1890, VICTOR furnaces have stood for quality, permanent heating satisfaction *and* sales appeal. The VICTOR line, complete in styles and sizes, with exclusive features of genuine merit for easier selling, takes you out of the competitive class. Begin selling VICTORS and you'll sell more furnaces.

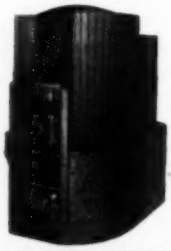
FOR CONVERSION FROM COAL TO OIL OR GAS

VICTOR de luxe furnaces, built of boiler plate steel, welded and riveted for positive gas and smoke tightness are ideally constructed for satisfactory conversion from coal to oil or gas with practically no loss in efficiency.

ROUND COAL FURNACES



VICTOROIL FURNACES



HEAVY DUTY FURNACES

FURNACES • OIL BURNERS • GAS BURNERS • STOKERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

Stainless is back for roof drainage

MANY ADVANTAGES . . . GREATER PROFITS

Yes, ARMCO Stainless Steel is available again for gutters, leaders, conductor pipe and accessories . . . and even for certain types of roofs. There are stainless hangers and nails also, to make your job completely corrosion-resistant.

The workability of 28-gage Type 301 ARMCO Stainless is about the same as that of 26-gage galvanized steel. Soldering is simple and the only precaution is to remove all residue of soldering flux after the joint is made.

You can tell prospects that the great strength of ARMCO Stainless is insurance against cracking due to expansion and contraction under temperature changes. When properly installed, its high elastic limit prevents sagging of unsupported sections of gutter. Its soft, satiny finish blends well with any color scheme and there is no rusting or greenish stain to discolor adjoining building areas.

Another important advantage of ARMCO Stainless is that it actually costs less per square foot than any other quality metal commonly used for roof drainage. This with its permanence and freedom from replacements enables you to sell complete satisfaction — at a good profit. Write today for a free copy of the booklet, "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories." The American Rolling Mill Company, 373 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

TURN IN YOUR SCRAP NOW—
HELP MAKE MORE STEEL

Scrap piles in most steel mills are critically low. Unless this shortage is relieved, everybody must wait longer for steel. You can help. Check your unusable tools, machines and obsolete equipment. Collect all the iron and steel scrap you can find and speed it through regular channels to the mills. Remember—*more scrap means more steel, sooner.*

ARMCO

THE AMERICAN ROLLING MILL COMPANY

• SPECIAL-PURPOSE SHEET STEELS • STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE

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for Homes, Apartments, Factories, Stores

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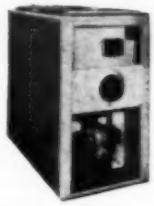

VICTOROIL FURNACES

HEAVY DUTY FURNACES

FURNACES • OIL BURNERS • GAS BURNERS • STOKERS • BLOWERS • ACCESSORIES

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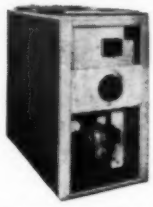

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• SPECIAL-PURPOSE SHEET STEELS • STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE

* STAKE YOUR CLAIM FOR FUTURE PROFITS

EASY TO SELL, INSTALL AND SERVICE, BECAUSE...

● Fully Automatic, Oil-Burning ● Controlled Combustion ● Vacuum-Draft ● Single Motor Operation ● 120,000 B.T.U. Output ● 1200 C.F.M. ● Automatic Humidifier ● Two 16 x 25″ Filters ● Horizontal Fire Tunnel ● Spiral "Ramp" Economizer ● Centralized, Visible Servicing ● Factory-Wired ● Electric Ignition ● Meets All Code Regulations

PROVED by engineers, by heating trade, by users—through five years of tested performance.

FAMED OIL-BURNING WINTER AIR-CONDITIONER
The only domestic furnace with Vacuum-Draft!

MODEL 120-B

*

Stake your claim for future profits by selling only products of merit and proved reputation today. Customers in the coming "buyers' market" will buy *only the best . . . from the best!* Their confidence in you, confidence in your products, will govern your sales. *Build that confidence today with Norge Heat!*

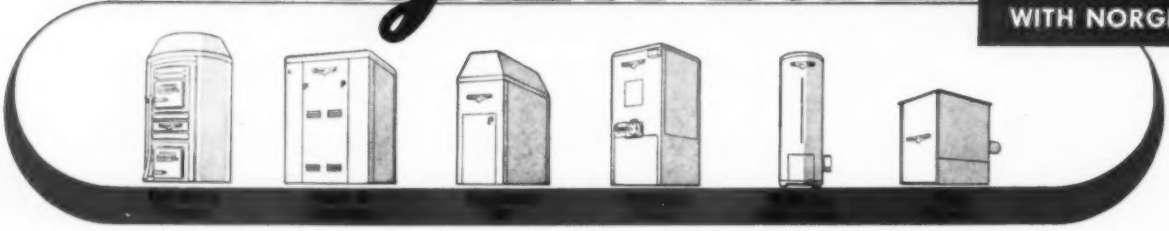
Like other Divisions of Borg-Warner Corporation, Norge Heat produces for consumer satisfaction and dealer profits. This policy insures Norge Heat Division's continued leadership of the heating industry. *Stake your claim with a name of fame!*

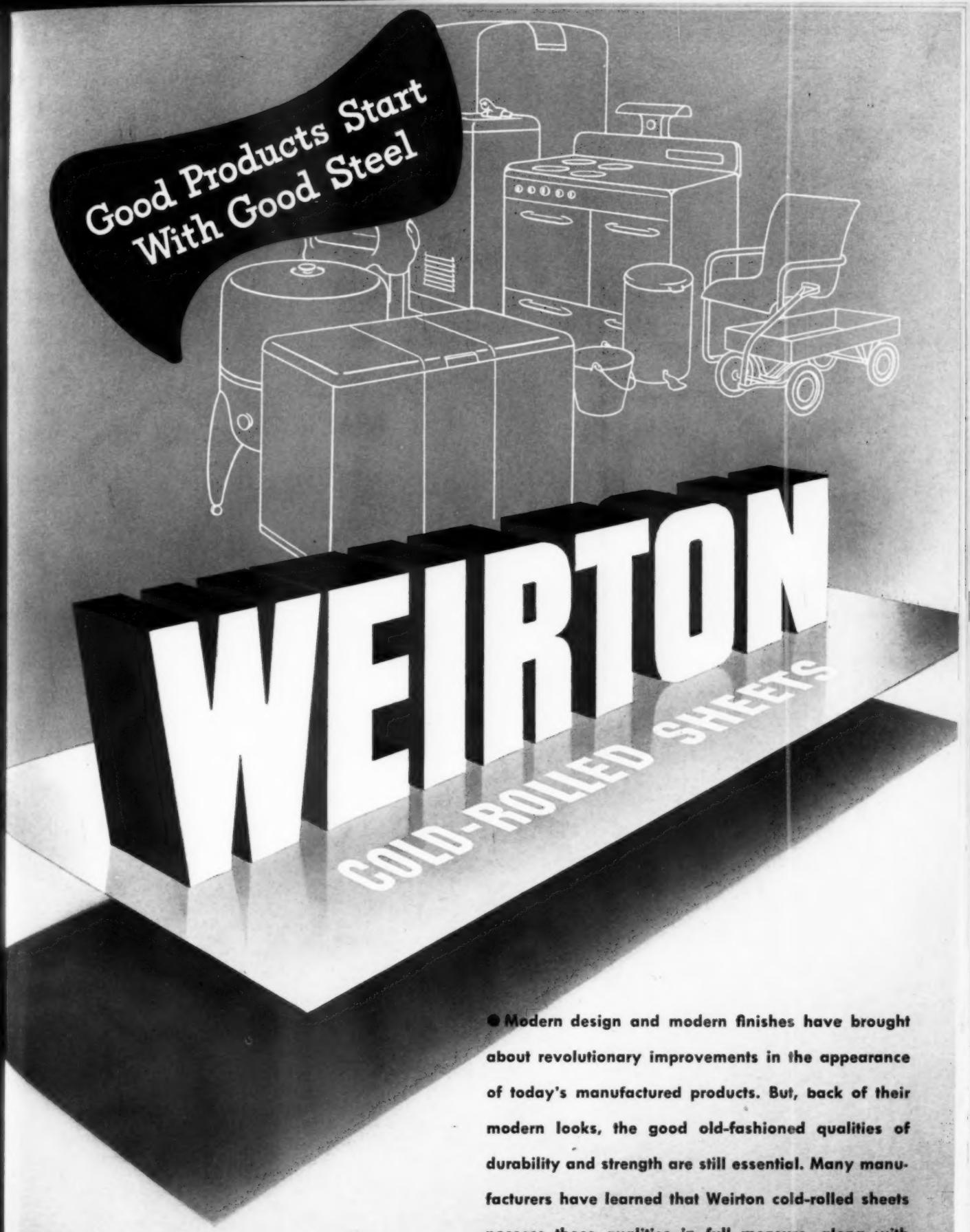
Norge Heat Division, Borg-Warner Corporation • 574 East Woodbridge St., Detroit 26, Michigan

B-W Products of BORG-WARNER

Norge Heat

"LIVING'S A TREAT WITH NORGE HEAT"





● Modern design and modern finishes have brought about revolutionary improvements in the appearance of today's manufactured products. But, back of their modern looks, the good old-fashioned qualities of durability and strength are still essential. Many manufacturers have learned that Weirton cold-rolled sheets possess those qualities in full measure, along with exceptional drawing and forming qualities that speed production and reduce tool expense and scrap losses.

EIRTON STEEL CO.

EIRTON, W. VA. *Sales Offices in Principal Cities*

WEIRTON STEEL COMPANY

Division of **NATIONAL STEEL CORPORATION** *Executive Offices, Pittsburgh, Pa.*

Profits Soar with this New *Magic Dial* clock thermostat merchandising program

- ★ Striking Counter or Window Display
- ★ Powerful Sales Letters for Your Letterhead
- ★ Salesmaking Envelope Stuffers or Handout Literature
- ★ Radio Spot Announcements
- ★ Telephone Canvasser

Here is a hard-hitting powerful merchandising program which will ring up added profits and build real customer satisfaction. It features a sales-getting counter display — and other effective sales helps which tell a graphic story of the world's finest clock thermostat—the *Magic Dial*. The *Magic Dial* Clock Thermostat practically sells itself — its rich white gold beauty, its exclusive operating advantages, its easily visible clock face . . . PLUS the fuel economy of automatically lowered night temperature — are sales advantages which mean true customer satisfaction. This program is available to you through your heating equipment manufacturer. Investigate today!

PERFEX CORPORATION, Milwaukee 7, Wis., Perfex Controls Ltd., Toronto 1, Ont.

PERFEX

TWIN CONTACT CONTROLS

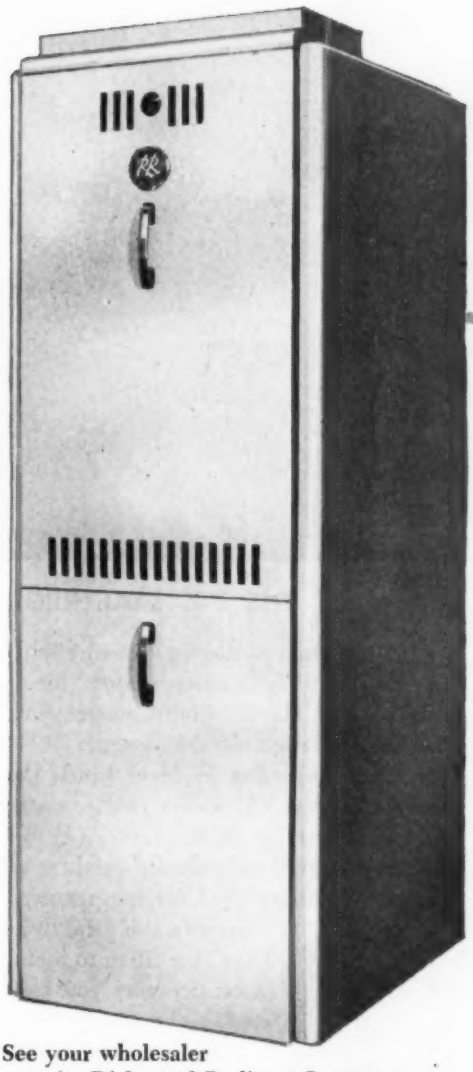
MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAMES OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

WORLD'S FINEST CLOCK THERMOSTAT . . . the *Magic Dial*

Dealers! ASK YOUR HEATING EQUIPMENT MANUFACTURER HOW YOU CAN OBTAIN THIS POWERFUL DISPLAY KIT *Free!*

"High Cost" Complaints getting you down?

AVOID THEM by installing this Richmond packaged conditioner ... shipped completely assembled



The Richmond Winter Air Conditioner can be quickly installed in basement or utility room—requires only about 4 to 6 sq. ft.

The smartly styled jacket with white "kitchen cabinet" finish is a mark of quality and good value throughout.

Quick facts about the Richmond Gas Winter Air Conditioner

- **Heat exchanger cast in one piece of chrome-iron alloy for long life**
- **Baked-on Dulux white enamel finish**
- **Completely packaged, quickly installed**
- **Spun-glass filters easily renewed**
- **Quiet—blower fan floats on rubber**
- **Clean—burns gas**
- **Four sizes: 66,000; 90,000; 115,000 and 140,000 btu input**
- *Carries both AGA approval and a one-year replacement guarantee*

See your wholesaler
or write Richmond Radiator Company, 19 East 47th Street, New York 17, N. Y., for name of nearest Richmond wholesaler.

FACTORIES AT METUCHEN, N. J., MONACA, PA., NEW CASTLE, DEL., UNIONTOWN, PA. (2)

RICHMOND RADIATOR COMPANY
Affiliate Reynolds Metals Co.

Enameled Cast Iron Ware • Vitreous China • Porta-Glass • Gas Boilers • Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators

"Put 'em in and forget 'em.."

The Best Buy in Damper Controls"

THE P-K DIAL REGULATOR

HERE are some of the reasons why so many heating contractors call the P-K Dial Regulator "the best buy in damper controls"... (1) The unique frame prevents air leakage, promoting efficient operation of the system; (2) Eccentricity of hole in frame with opening in lever binds the bearing and prevents damper rattles; (3) Lever rotates on frame hub, assuring free and easy operation of regulator; (4) Wing nut locks damper in desired position, yet permits quick re-adjustment; (5) Locking nut with key furnished for tamper-proof installation.

Specify P-K Dial Regulators on your next job. They're a cinch to install—on round or flat surfaces. See why you can "put 'em in and forget 'em". Your nearby P-K distributor will be glad to take care of your order. For folder describing complete P-K line of Damper Controls—write Parker-Kalon Corp., 200 Varick Street, New York 14, N. Y.

JIFFY REGULATOR

. . . one of the simplest of all damper regulators—developed to meet a demand for a low-cost device for domestic air conditioning and furnace installations.

UNXLD

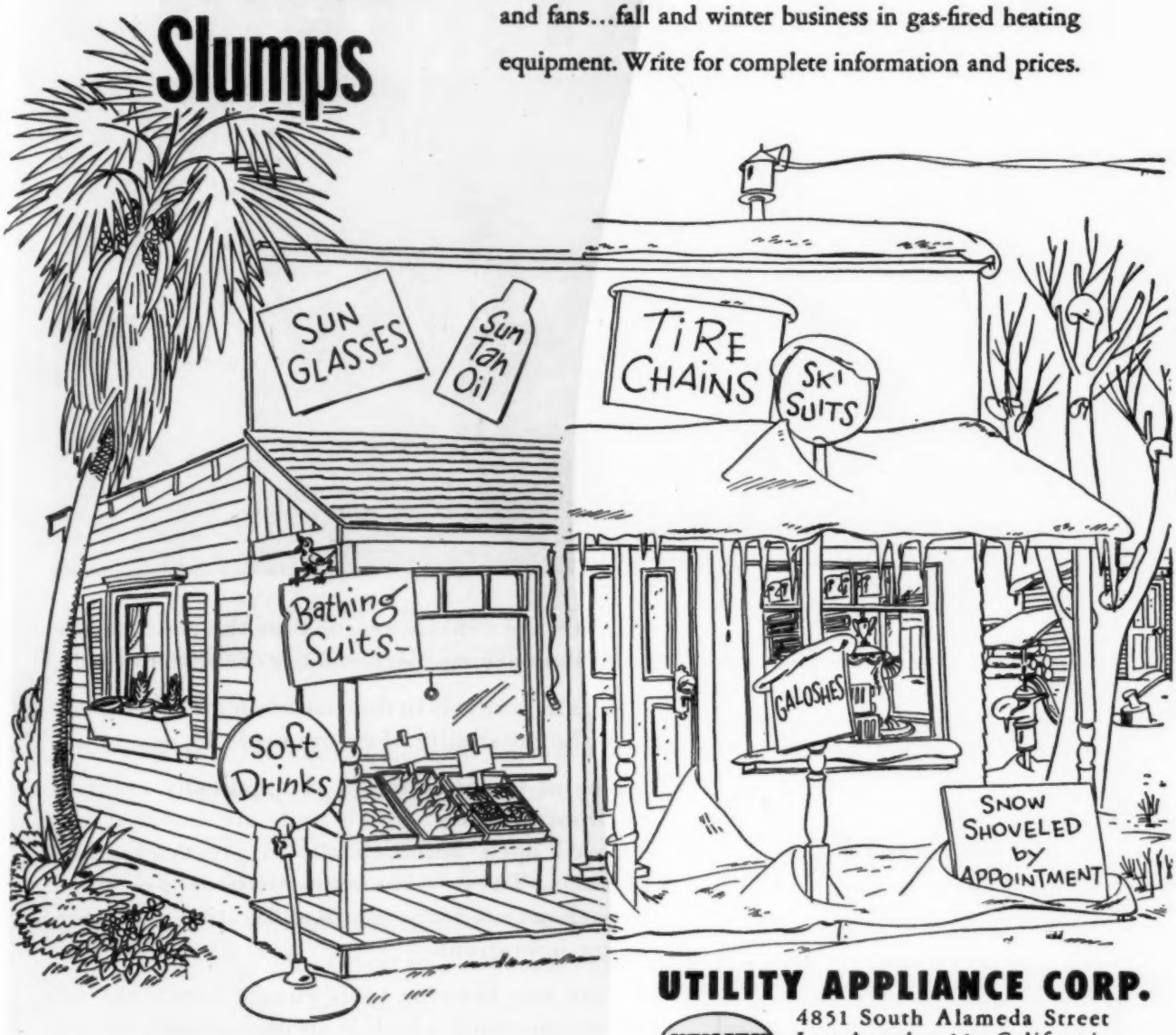
. . . a quadrant type of damper control made of heavy gauge steel or brass with lever of malleable iron or cast brass. Recognized as the "standard" for manually operated damper controls.

PARKER-KALON P-K DAMPER CONTROLS

TYPES FOR EVERY JOB

No Seasonal Slumps

Dealers who handle the complete Utility line have an active business all year — no seasonal slumps — profit every month. Crews keep busy and the cash register jingles . . . with spring and summer sales of air coolers and fans...fall and winter business in gas-fired heating equipment. Write for complete information and prices.

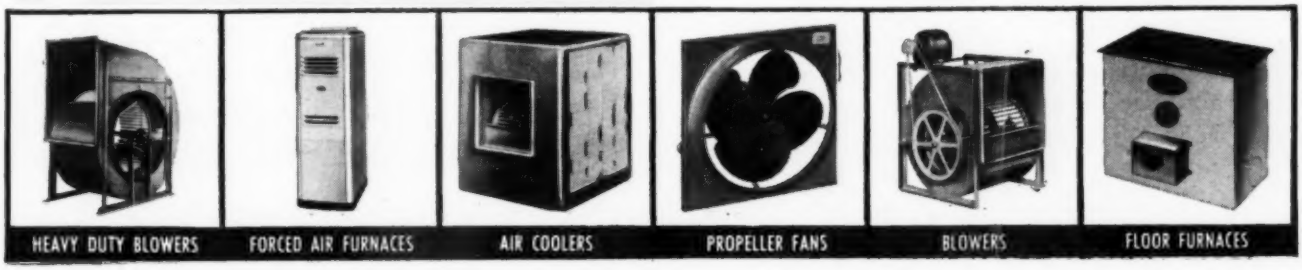


UTILITY APPLIANCE CORP.

UTILITY

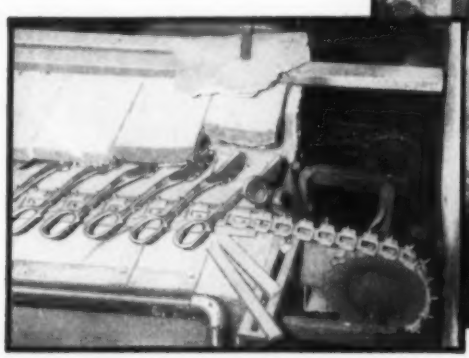
4851 South Alameda Street
Los Angeles 11, California

DIVISIONS
UTILITY FAN CORPORATION
GAFFERS & SATTLER • OCCIDENTAL STOVE CO.

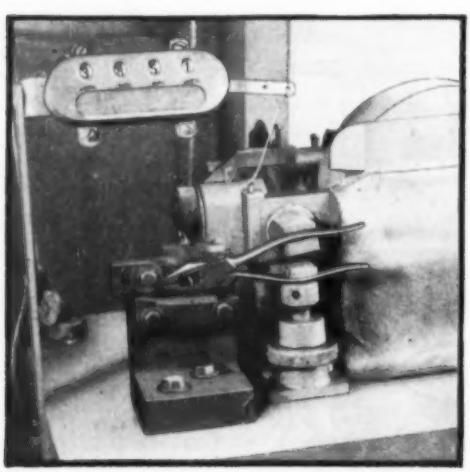


Controlled HEAT TREATMENT INSURES UNIFORMLY SUPERIOR CRESCENT* TOOLS

This automatically-controlled, rotary-type electric furnace assures uniform heat-treatment of every Crescent Tool.



Automatic timing and automatic heat control insure accuracy of hardening in snips and pliers going through this furnace.



Both Crescent and competitive pliers are tested to destruction in this continous cutting machine. Quality of product as compared to other makes can be easily determined.

● There are definite reasons for the consistently better-than-average performance of Crescent Tools.

Automatic controls in this hardening furnace overcome the possibility of errors made by operators.

Degree of temperature is automatically controlled. Doors through which tools are inserted and removed open automatically at pre-determined intervals. These automatic methods are used throughout all Crescent heat treating and tempering operations.

In this way inferior tools cannot reach the ultimate consumer, which is another reason for the wide popularity of Crescent products.

*CRESCENT TOOLS
Give Wings to Work

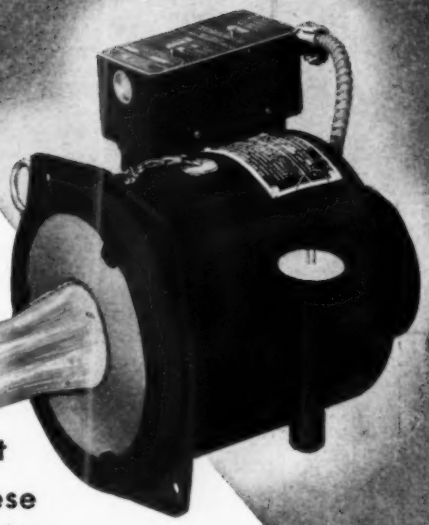
CRESCENT TOOL COMPANY, Jamestown, N. Y.

*"CRESCENT" is our trade-mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.

CONCO *Means..*

REAL PROGRESS..

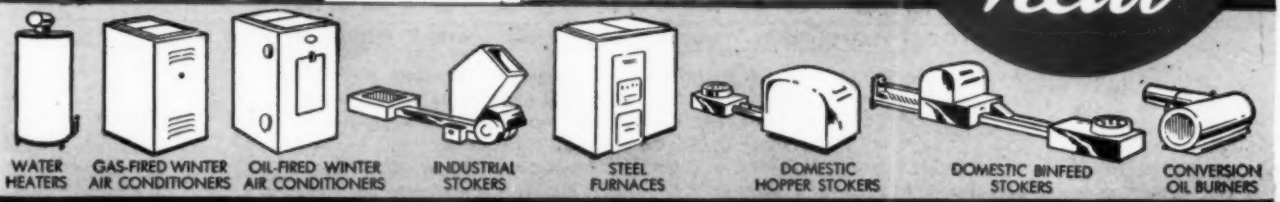
The revolutionary new Conco-Breese horizontal oil burner spells real progress in the heating industry . . . real progress and profitable business for all Conco distributors and dealers.



This modern vaporizing oil burner performs efficiently and economically in all types of heating equipment, cooking ranges and hot water heaters. The addition of the new Conco-Breese horizontal oil burner to Conco's other outstanding equipment makes the profitable, customer-satisfying Conco line *truly complete.*

Twentieth century scientific advancements and engineering improvements in heating equipment design and operation are welcomed by Conco distributors and dealers. They *know* that Conco heating equipment will always be the finest and represent the latest in engineering skill and research.

CONCO *heat*



CONCO ENGINEERING WORKS

MENDOTA, ILLINOIS

PROFITABLE JOBS like these are handled best

—with U·S·S Stainless Steel

SHEET metal shops that have gained a reputation for turning out good work have found that when it's a stainless steel job it pays to use *U·S·S Stainless.*

This *perfected* Stainless Steel is so uniform in composition, in finish and physical properties that it assures the utmost uniformity in fabrication. This means that once you set up the proper fabricating procedures, you can depend on U·S·S Stainless Steel to go through your shop smoothly and uniformly, with least trouble and delay, and with no variation in results. And that is true for *every* order of U·S·S Stainless you use.

Remember this, if your shop has worked galvanized steel you will need no additional equipment to handle U·S·S Stainless Steel successfully. To get the best results with it, send for our new book "Fabrication of U·S·S Stainless and Heat Resisting Steels" and use it confidently as your guide. There's no better time than right now to establish yourself as a specialist in Stainless Steel—and there's no better steel than U·S·S Stainless to help you reach that goal.

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS STAINLESS STEEL UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
UNITED STATES STEEL SUPPLY COMPANY, *Chicago, Warehouse Distributors*
United States Steel Export Company, New York

7-579

LISTEN TO . . . *The Theatre Guild on the Air*, presented every Sunday evening by United States Steel. American Broadcasting Company, coast-to-coast network. Consult your newspaper for time and station.

UNITED STATES STEEL

Huge showroom where Thatcher Heating Equipment is featured by General Heating Equipment Service Corp., Harry Weidner, Mgr., 363 N. High Street (directly across from the railroad station) Columbus, Ohio.

THATCHER scores high in COLUMBUS

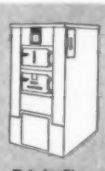
Look What's Happening In Columbus! As in all other parts of the country, Thatcher proves outstanding. Harry Weidner, Manager of General Heating Equipment Service Corp., tells us, "Thatcher meets and overcomes the roughest kind of competition — the high quality of Thatcher's entire line enables me to do a real selling job".

These Reasons Behind Thatcher's High Score In Columbus May Be the Key to New Profits In Your City.

1. Customers like Thatcher's rugged construction — economical, service-free operation.
2. People know and trust the name and reputation Thatcher's built as heating specialists for 97 years.
3. The way Thatcher cooperates with distributors and dealers can turn difficult jobs into smooth operations.
4. Thatcher's up-to-date line offers a solution to almost any residential heating problem.

Remember — you recommend yourself when you recommend Thatcher — your warm friend since 1850.

Thatcher Comfortmaster Oil-fired Air Conditioner



Triple-Fire All-Purpose Boiler

GA Comfortmaster Air Conditioner

Thatcher Oilmaster Automatic Oil-fired Boiler

Thermaster Gravity Furnace

KEEP YOUR EYE ON THATCHER

Thatcher FURNACE COMPANY
Garwood, New Jersey

SPECIALISTS IN HEATING SINCE 1850

field

"Always the Pace Setter"

DEVELOPS The new, sensational, proved-by-test combination Automatic Barometric Draft Control and Check Damper

BAROCHEK

Developed for economy and safety, BAROCHEK reduces the cost of supplying and installing both a barometric control and a check damper. BAROCHEK prevents the usual waste of heat out of the stack, provides proper combustion conditions, and limits the drafts which a chimney develops. BAROCHEK provides real savings to the furnace manufacturer, the installer, and the user.

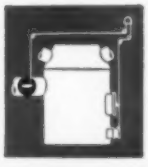
BAROCHEK provides safety through proper combustion control in hand-fired coal burning furnaces and boilers. With soft coal especially, uncontrolled drafts through a wide open ash pit and flue pipe will make the furnace and flue pipe reach dangerously high temperatures and become a definite fire hazard.

BAROCHEK combines the features of the famous 8-9" size Field Draft Control and a check damper in one.

Designed and developed as the result of recommendations by leading heating and research engineers.

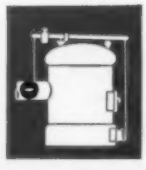
The "Best for the Finest"

HAND-FIRED FURNACES



On warm air furnaces, whether controlled by damper motor or by hand, the chain ordinarily attached to a check damper is connected to the lever on the new Field BAROCHEK Control. The check damper is eliminated, or sealed if already installed.

HAND-FIRED BOILERS



On boilers with diaphragm damper control, one end of control chain is attached to the lever on the Field BAROCHEK Control, while the other end of the chain is fastened to the counter balanced steam pressure bar.

WRITE FOR COMPLETE INFORMATION AND DESCRIPTIVE LITERATURE

FIELD CONTROL DIVISION

H. D. CONKEY & COMPANY · MENDOTA, ILLINOIS

Count on Janitrol FOR LONG-LASTING PERFORMANCE

Janitrol Winter Air Conditioners are available in 6 sizes, all fully AGA approved, with ratings from 60,000 to 180,000 Btu. imput per hr. Extremely compact, the small unit requires only an 18x27 inch floor space.

JANITROL Gas-Fired heating equipment gives top-notch performance . . . and keeps it up for years and years of satisfying service. Why? Because Janitrol is designed for long lasting operation.

For example, Janitrol cast iron Multi-Thermex heating tubes are *designed* to take *exactly the right amount* of heat from the burned gases passing through them. Too little heat extraction means waste of fuel. Too much can cause condensation and corrosion on heat transfer surfaces.

Burnouts are eliminated by the unique manner in which the Multi-Thermex tubes fit snugly over the compact Amplifire burners . . no bulky combustion chamber to build up excessive heat at the base of the tubes.

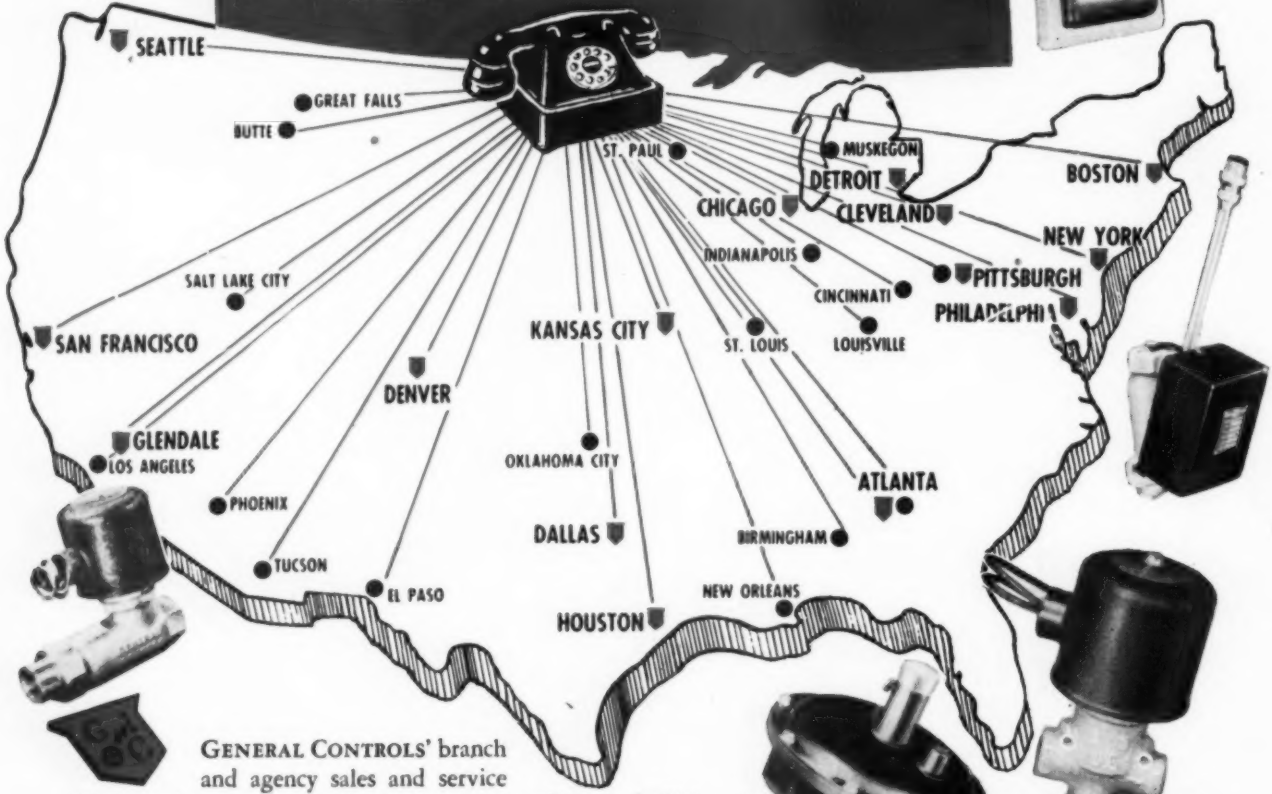
Patented design of Janitrol ribbon type burner assures uniform expansion and contraction along the entire length of each alloy strip forming the Amplifire burner heads. No buckling, no twisting, no breaking loose can occur with this construction.

And these are only a few of the many design developments which make Janitrol your best bet in supplying the heating requirements of your customers to their greatest satisfaction. Remember, Janitrol is built to last. No other gas-fired heating equipment has all of Janitrol's engineered advantages! For more information, write Surface Combustion Corporation, Toledo 1, Ohio.

Janitrol GAS-FIRED HEATING EQUIPMENT

32 Talking Points

FOR GENERAL CONTROLS SERVICE WHERE AND WHEN YOU WANT IT



GENERAL CONTROLS' branch and agency sales and service offices are located in principal cities. Their adequate facilities, the experience and skilled counsel of their personnel are as conveniently near to you as your telephone.

Of equal importance—when you are considering automatic temperature, pressure and flow controls—is that General Controls are *good* products, engineered right, built right, proved by performance. We are in the automatic controls business. Our business *is* controls and thousands will tell you that we *know* our business.

There are talking points about General Controls' engineering and field service that should benefit you... as they are benefiting others in your line of business. A wire, letter or telephone call (see yellow classified section of principal city telephone directories) will bring a qualified Controls Engineer to your office.

FOR COMPLETE SPECIFICATIONS request new Catalog and Service and Instruction Manuals.

36-1

GENERAL CONTROLS

1001 ALLEN AVENUE GLENDALE 1, CALIF.

Manufacturers of Automatic Pressure, Temperature & Flow Controls

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

A EXPERIENCE IS THE BEST TEACHER

B OVER A 26 YR. PERIOD DEALERS HAVE LEARNED ABC EQUIPMENT IS EASIER TO SELL.

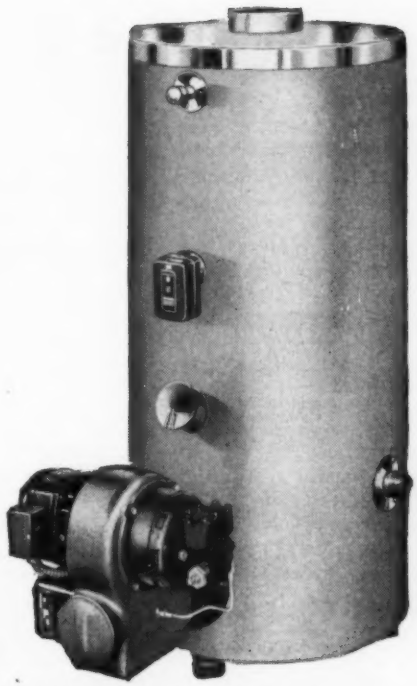
C TODAY MORE DEALERS THAN EVER ARE FEATURING . . . ABC Oil Burner

The continually growing popularity of ABC oil burning equipment is definite proof there is no substitute for experience. Dealer confidence in the ability of ABC to deliver equipment that is easier to sell, easier to install and easier to service is based on the knowledge that ABC has done just that . . . *for more than a quarter of a century.* You can put that knowledge, experience and reputation to work for you! Simply write for complete dealership details now.

ABC Oil Burner

FAMOUS ABC PRESSURE BURNER

A complete unit—with built-in combustion chamber, tank or tankless heater, jacket, burner and controls—at a really attractive price. Designed for longer, more efficient service.

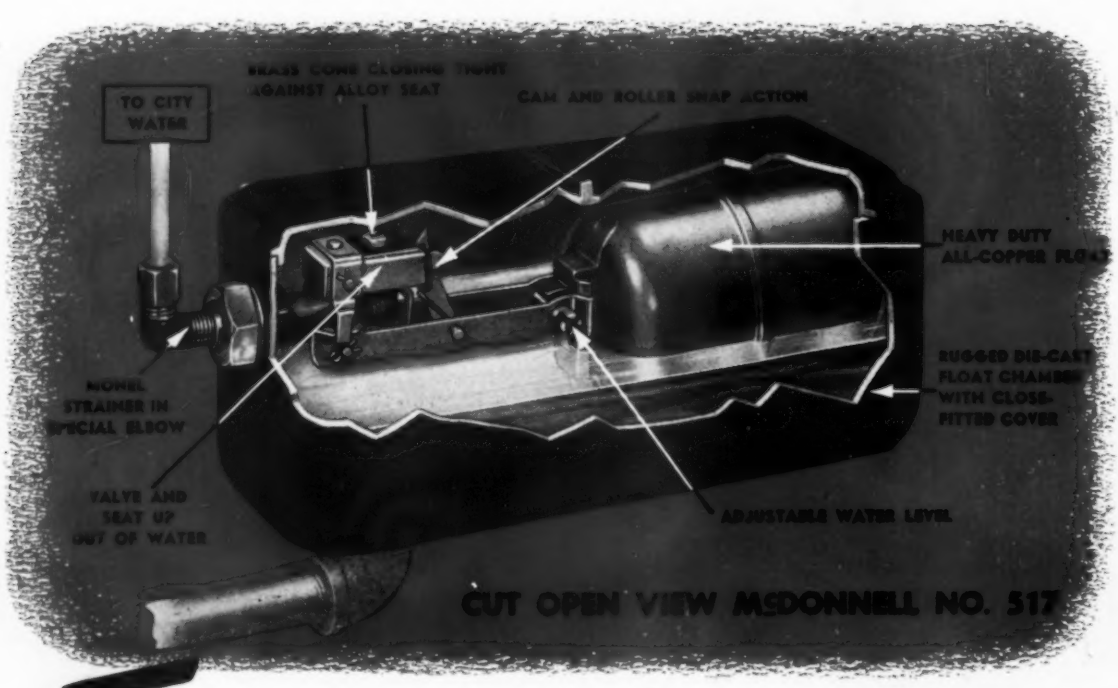


HANDSOME, ECONOMICAL STEEL BOILER UNIT

Known and recognized as one of the finest gun burners in America for domestic heating needs! Smooth, vibrationless operation, exclusive engineering features that assure unusually efficient operation.

AUTOMATIC BURNER CORPORATION

1823 CARROLL AVENUE • CHICAGO 12, ILLINOIS

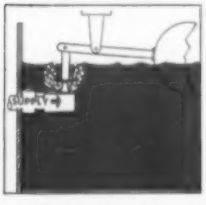

TO CITY WATER
BRASS CONE CLOSING TIGHT AGAINST ALLOY SEAT
CAM AND ROLLER SNAP ACTION
HEAVY DUTY ALL-COPPER FLOAT
RUGGED DIE-CAST FLOAT CHAMBER WITH CLOSE-FITTED COVER
MONEL STRAINER IN SPECIAL ELBOW
VALVE AND SEAT UP OUT OF WATER
ADJUSTABLE WATER LEVEL
CUT OPEN VIEW McDONNELL NO. 517

THERE'S NOTHING LIKE IT!...

A man who knows his float valves examined the McDonnell Float Valve pictured here and said, "Looks like you are the first people to take this matter seriously!"

You quickly discover how well this description fits the McDonnell No. 417 when you compare it with other valves. Everything about it—in both design and construction—shows that its development was one more chapter in the story of "Doing One Thing Well"—to you who use them, a *vital* thing.

★ NO DRIBBLING

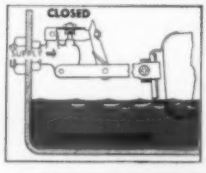


By its very nature, the conventional float valve is sure, sooner or later, to get into trouble. Basically, it is simply a float and arm attached to a valve which cracks open and dribbles water into the pan as soon as the water level begins to fall. Obviously, such a valve is rarely wide open. It simply attempts to maintain a level by constantly dribbling water. Exposed, as it is, to high temperature, it is soon plugged up with lime or is clogged by debris and foreign matter as you know only too well.

★ INSTEAD OF DRIBBLING—SNAP ACTION!

The biggest difference in the McDonnell Float Valve is the valve mechanism which gets away from this dribbling action. Its ingenious cam and roller construction snaps it wide open when the float drops ¼ inch. This opens up a full stream of water . . . thoroughly flushes out the seat. When the water level is restored, the cone seats with the same positive snap action. Moreover it seats tight against water supply pressures up to 150 lbs.

★ TIGHT CLOSING VALVE—UP ABOVE WATER

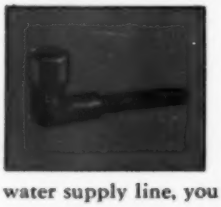


This positive "snap action" alone would place the No. 417 in a class all its own, but it is only proof-number-one that there is nothing else like it. In the current model the valve and seat are up out of the water. The brass cone is firmly thrust into an alloy seat to provide a water-tight closure.

★ FLOAT LEVEL ADJUSTABLE

A heavy gauge copper float (not plated) gives ample float power, and an outstanding feature is the slide which permits raising or lowering the float by merely loosening one screw so that the water level in the pan can be adjusted.

★ MONEL STRAINER PROTECTS VALVE



An extra precaution to assure positive operation is the monel strainer mounted in a special compression fitting connected to the city water supply, where it can be easily removed and cleaned. With the valve located out of the water, with the sluicing action of a full stream to keep it clean, and with the added safeguard of the strainer in the water supply line, you can be sure *this* valve *will* work right.

★ INDIVIDUALLY TESTED

Everyone of these valves is individually tested. Their feeding action is tested and their ability to seat against water pressure up to 150 lbs. is tested. Leading manufacturers of warm air furnaces, air washing equipment, dehumidifying apparatus, and cooling equipment have adopted the McDonnell Snap Action Valve. They are available without float chamber (No. 417) or mounted in a sturdy die-cast chamber with neat, well-fitted cover (No. 517). In these two forms they are adaptable to every requirement for a valve of this kind. Ask for details.

McDONNELL & MILLER, INC., 1318 Wrigley Building, Chicago 11, Illinois

Doing One Thing Well

McDONNELL SNAP ACTION FLOAT VALVE

. . . with the ingenious

Announcing...

JONES & BROWN, INC.

are now

National Distributors

for KO-Z-AIRE

AIR CONDITIONING UNITS

(OIL OR GAS FIRED)

Distributors and Dealers are now being appointed for this highly profitable nationally known line of furnaces. Excellent territories in all parts of the nation are available. Write, wire, or phone immediately for prices and details.

JONES & BROWN, INC.

NATIONAL DISTRIBUTORS

441 Sixth Avenue

PITTSBURGH 19, PA.

Simple and Easy as 1-2-3

. . . and the job is done. Berger SNAPTITE Eaves Trough is a real time-saver. Here's how it works: Slip two joints together . . . snap the bead into place . . . pinch the edges . . . solder if desired. No tacking is needed—no trimming to length—no slip joint trough is necessary. The snap beading forms a close-fitting solid lap. The installation is strong and rigid.

SNAPTITE Eaves Trough always is uniform in size and shape—further assurance of fast installation. It is hung the same way as ordinary eaves trough...requires no special equipment. And it can be used with other standard eaves trough.

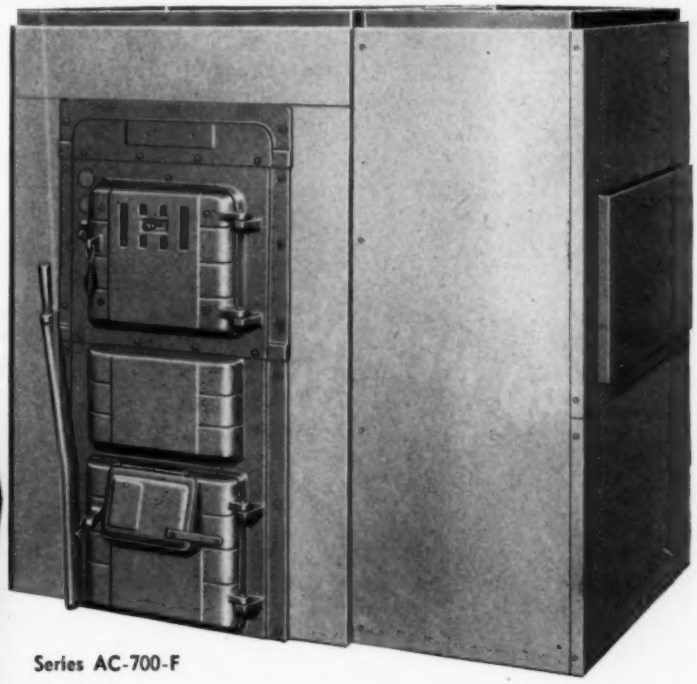
See your local distributor about SNAPTITE Eaves Trough—also Berger Conductor Pipe and Accessories, Roofing of all types and Metal Lath.

BERGER
REG. U. S. PAT. OFF.
SNAPTITE EAVES TROUGH

BERGER MANUFACTURING DIVISION • REPUBLIC STEEL CORPORATION
CANTON 5, OHIO • Warehouses in Boston, Philadelphia and St. Louis

REPUBLIC STEEL
REG. U. S. PAT. OFF.

MONCRIEF'S *New* All Fuels AIR CONDITIONING UNIT



Series AC-700-F

A Coal Fired Unit, Easily Converted Well Adapted — For Gas, Oil or Stoker

Moncrief's new, compact, all fuels Air Conditioning Unit is one of the easiest merchandising, greatest sales-getting units ever offered to the heating trade. Here's a unit that solves your fuels restrictions or regulations—a unit that "lets-you-in" on any heating job.

Advanced cabinet design and construction allow the full height blower compartment to be assembled at either the right or left side of heating compartment.

The long fire travel and large heating surface of the rugged, gas-tight, steel heating element make this unit easily adaptable for oil, gas or stoker firing.

Abundant circulation of filtered air is assured by the large, quiet operating blower, with rubber insulated motor. Large area filters provide a long period of effective air cleaning . . . an automatic humidifier is standard equipment.

Series L
Gas-Fired, Steel
Air Conditioning
Unit

Series W
Gas-Fired, Steel
Gravity Furnace

Series U
Gas-Fired, Steel
Utility Air Conditioning Unit

Series P
Oil Fired, Steel
Air Conditioning
Unit

Series AC-700
Coal-Fired, Steel
Air Conditioning
Unit

Series 700
Coal-Fired, Steel
Gravity Furnace

Series C
Coal-Fired, Cast
Gravity Furnace

Series VW
Oil Fired, Steel
Gravity Furnace

Series VL
Oil Fired, Steel
Air Conditioning
Unit

Series VU
Oil Fired, Steel
Utility Air
Conditioning Unit

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

PETRO MESSAGES BY THE MILE PRE-SELL OIL-BURNER PROSPECTS FOR YOU!

Petro national advertising, in leading magazines and newspapers, is helping build oil burner sales for you!

OVER 16,000,000 Petro sales messages are appearing every month. Laid end to end, they would extend for several miles!

Each and every one of these messages is working for *you!* It is *your* advertising. Reaching the worthwhile oil-burner prospects in your territory, it is educating them on Petro reliability and low-cost performance!

Are you cashing in on this hard-hitting promotion? See the Petro wholesaler in your area. Get the full story about Petro equipment to meet your needs.

Petro oil burners, in pressure-atomizing models, use from 1 to 18 gallons of domestic fuel oil per hour . . . and in rotary cup models, from 11 to 145 gallons of heavy commercial-industrial oils per hour.

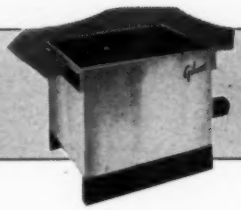
PETRO
REG. U. S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT SINCE 1903

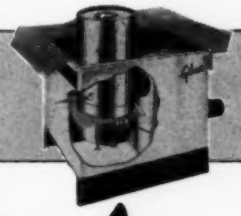
What
OIL BURNER
is sold and installed only by heating men?
PETRO
REG U S PAT OFF
OF COURSE!
Your heating contractor knows home-heating. With all his experience and technical know-how to help him, he understands how to install your Petro Oil Burner correctly — so it will give you the many years of low-cost fine performance built into it by the maker.
When you place your heating problem in the hands of an established heating man, you put it where it will receive the same care, common sense and good judgment that were used in building up that contractor's entire business reputation.
Sold and installed by heating contractors everywhere
PETROLEUM HEAT and POWER CO.
Stamford, Conn.
Since 1903 — Makers of fine oil heating equipment for home and industry

PETROLEUM HEAT AND POWER COMPANY · STAMFORD, CONNECTICUT

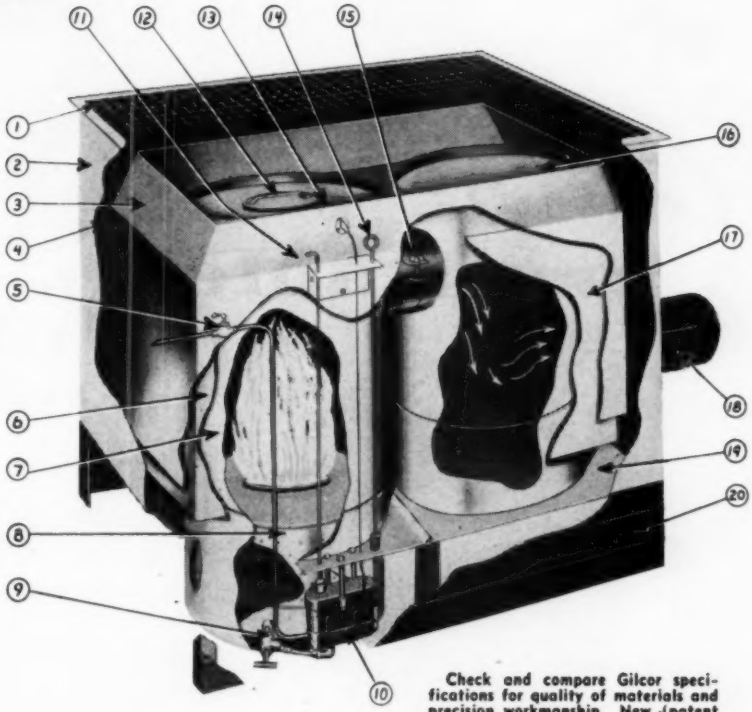
Petro Refineries in: CORPUS CHRISTI AND PORT ISABEL, TEXAS. Fuel Oil Bulk Plants and Distribution Terminals in: BOSTON • PROVIDENCE STAMFORD • MT. VERNON • NEW YORK • MINEOLA • BROOKLYN • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO



A NEW Gilcor FLOOR FURNACE



Better 20 ways!



1 FURNACE GRILLE. Mesh type, finished metallic Mahogany. Withstands 350 P.S.F. at center.

2 OUTSIDE CASING. Bonderized; beautifully finish-d in silver gray high heat, high gloss enamel.

3 OUTER LINER. 22 gauge aluminized steel—this specially processed steel far excells any other type of coated steel . . . lasts a lifetime. Liner is scientifically designed—takes cold air return from all four sides, gives maximum warm air distribution.

4 LINER SUPPORT BRACKET. Four liner support brackets space liner properly, rigidly.

5 OIL SHUT-OFF PET COCK. Easily disconnected.

6 INNER LINER. Aluminized steel; provides additional heating surface, allows maximum heat extraction. Prevents radiant heat in cold air chamber.

7 COMBUSTION CHAMBER. 18 gauge aluminized steel. Designed for maximum efficiency.

8 BURNER. Epecially designed low draft burner; operates cleanly and with maximum efficiency.

9 OIL INLET WITH CLEANOUT PLUNGER. Carbon is removed without trouble.

10 CONTROL. Improved constant level control. Accurately meters oil; has safety shut-off in case burner goes out. (NOTE: Manually operated control or automatic controls with thermostat optional.)

11 MANUAL OPERATION CONTROL ROD. Settings can be made from floor level with extension key.

12 COMBUSTION CHAMBER DOOR. Sealed air tight.

13 TEMPERATURE LIMIT CONTROL THERMO BULB. Automatically changes burner to low fire if grille temperature becomes too high.

14 CONTROL RE-SET ROD.

15 RETAINING BAND. Asbestos lined. By removing this, inner liners, and breaking fuel line at shut-off, combustion chamber, burner and controls can be easily removed for floor level servicing without disturbing rest of furnace.

16 RADIATOR. 18 gauge aluminized steel. Additional heating surface giving the unit the maximum amount of heating surface.

17 INNER LINER. Aluminized steel inner liner surrounding radiator.

18 AUTOMATIC DRAFT REGULATOR. Controls automatically the required draft for proper operation.

19 HEAVY ALUMINIZED STEEL TWO PIECE BASE SHEET.

20 BASE. Sturdy all welded construction base providing additional support for installation and shipping. Also used for display rack.

Write, Wire or Phone for Full Information

Check and compare Gilcor specifications for quality of materials and precision workmanship. New (patent pending) design gives unexcelled performance. Gilcor is completely tooled for production line manufacturing which makes possible a uniformly better, sturdier product at a lower cost.

With its two-tone enamel finish and sturdy base, it will attract attention on your floor. And its low price, coupled with inexpensive installation will attract profitable sales.

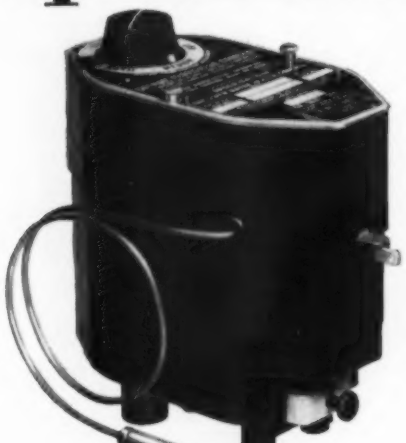
The new Gilcor automatic oil-burning water heater is truly a post-war product. The sparkling beauty of its satin aluminum case; the attractive appearance of its recessed controls; the efficiency and economy of its many exclusive features; all combine to make a heater that is really new, really superior . . . and one that really sells.

You get more with

GILCOR PRODUCTS CORPORATION
DOWAGIAC MICHIGAN

Gilcor — A BETTER PRODUCT

Comfort is profitable— Sell "DETROIT" Float Valve equipped water and house heating units—



"Detroit" CRC-239-W Float Valve For Water Heaters. Power element automatically regulates oil flow to burner to keep water hot. Easily operated adjustment enables user to regulate water temperature. "Fails safe" in case of damaged element. No electrical wiring needed.

"Detroit" CRC-239 Manual Float Valve For Space Heaters. Has a wide reputation for providing dependable control on all types of space heater applications.

The modern child, bathed daily, knows nothing of the discomforts of the old time Saturday bath in the washtub by the kitchen stove. It was never warm enough—there was never enough warm water.

Modern parents insist on a warm bathroom and plenty of hot water for their children and themselves.

Modern comfort standards demand modern heating devices—devices that are clean, reliable and provide steady, even heat. It's profitable to sell this kind of comfort. People want it and will buy it.

"Detroit" Float Valve equipped space heaters, water heaters, furnaces, and ranges provide this profitable comfort. "Detroit" Float Valves are well known for their reliability. Temperature compensated, they maintain constant oil flow at any given setting, regardless of oil temperature. They're simple, durable, easy to clean and service. 2828

"DETROIT" Float Valves — Guardians of The Home Fires

DETROIT LUBRICATOR COMPANY

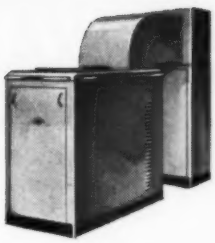
"DETROIT"

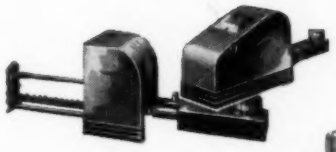
General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

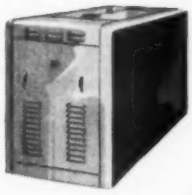
Division of American Radiator & Standard Sanitary corporation

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

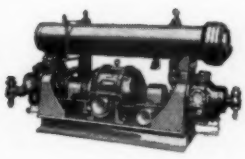
"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators







HEATING • AIR CONDITIONING
COMMERCIAL REFRIGERATION



12 MONTHS OF EVERY YEAR THERE'S PROFIT IN THE AIR WITH CHRYSLER AIRTEMP

Chrysler Airtemp's Triple Line can make your business the profitable local "headquarters" for everything in temperature control—heating, air conditioning or commercial refrigeration.

Dealers who in the past sold only one of these lines are learning how easy and how profitable it is to increase their business with Chrysler Airtemp.

A full line of products with a famous name makes Chrysler Airtemp the most desirable franchise in the heating and cooling industry. Some territories are still open *if you act now!* Write, wire or 'phone for details.

AIRTEMP DIVISION OF CHRYSLER CORPORATION, Dayton 1, O.
In Canada: Therm-O-Rite Products, Ltd., Toronto

Automatically Yours

CHRYSLER AIRTEMP
DIVISION OF CHRYSLER CORPORATION

PRODUCTS OF CHRYSLER CORPORATION

GAS? COAL? OIL? Depend upon NIAGARA DEPENDABILITY

In these days of fuel restrictions you must depend upon a heating line that meets *all* demands. That's Niagara—backed by over 55 years of experience in the manufacture of residential heating equipment—a line that has earned a wide reputation for high-quality construction and economical operation—a line that builds profits and prestige for furnace dealers.

NIAGARA *Oil-Fired* Winter Air Conditioners

These new Niagara furnaces burn the lower-priced No. 3 fuel oil. Model 30-90 provides maximum capacity of 90,000 BTU at registers while the larger Model 30-135 delivers 135,000 BTU. Complete units include all modern automatic regulators, blower, air filters and pressure (gun type) burner, housed in a green Hammerloid enameled cabinet.

SQUARE *or* ROUND

Coal Furnaces

CAST IRON *or* STEEL

Gravity and Air Conditioning

In Niagara coal-fired furnaces you will find a unit that meets any home heating requirement which calls for coal. Built with cast iron fire pot, feed section and radiator, these Niagaras are offered in several sizes with round casings. Two of the most popular sizes also furnished with square casings. Niagara furnaces of steel construction in a range of nine capacities are built with round casings —two popular models also available with square casings.

For winter air-conditioning installations, Niagara blowers are supplied as package units for installation with square cased coal furnaces.

Gas-Fired GRAVITY FURNACES AND WINTER AIR CONDITIONERS

Series 20 Cast Iron Winter Air Conditioner

Series 10 Upright Utility Model

Series 20 Cast Iron Gravity

Series 10 Steel Gravity

Three distinct types of Niagara gas-fired furnaces provide a complete line. Niagara Series 20 Cast-Iron *Winter Air Conditioners* in five capacities meet the demand for deluxe gas equipment. The same sizes are also built for *gravity heating.* Two Niagara Series 10 steel furnaces for air conditioning and two for gravity are also available. In addition, Niagara Models 10-75VAC and 10-100VAC for utility room and apartment installations meet today's demand for gas-fired winter air conditioners in complete package units.

Write *for the complete story. Learn what's* inside *and* back of *Niagara furnaces—the furnaces that meet any requirement: gas, oil, coal.*

NIAGARA FURNACE DIVISION

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We would be glad to send you the current Stainless Steel Stock List, showing sizes actually on hand in the following stainless products:

Sheets	Hexagons	Angles	Pipe Fittings
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Rounds	Flats	Tubing	Fastenings

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The Problem of Fuel Supply

ANOTHER informative and factual analysis, citing authoritative figures, about the petroleum industry is published in this issue. This is the second recent article on the subject. Each has been presented because we believe facts, confirmed by reliable information coming into our editorial department, excel the prejudiced discussions that often arise on national problems today. Unfortunately, it seems we can no longer hear calm discussions based on facts. Instead, they become biased from radical economic theory—leading to public befuddlement.

At the start of the new heating season, when oil-fired heating equipment represents an important percentage of our industry's sales volume, the available fuel oil supply continues as an important influence in maintaining that volume. It may be anticipated that both coal and oil, as well as food, for foreign relief will continue to claim public attention during the coming months. The present food dilemma—how to export huge quantities of food without affecting prices—may readily be transposed in terms of fuel, comfort, and health.

It should be remembered that each fuel industry has been beset with difficulties. Strikes, steel shortages, lack of transport, and floods have contributed to a fuel situation that will require super-human efforts to fulfill our domestic needs this winter. Each fuel requires transport. Few localities have a fuel source within range of local hauling. Each fuel puts load on the fuel transportation facilities, whether it be gas, coal, or oil.

Transport of gas is limited to existing pipelines which are in process of expansion. However, the shortage of steel and the export of steel tube have hampered these pipeline improvement programs to the extent that no relief may be expected from this quarter this winter. Strikes in the coal industry and assigning coal cars to the export of 4½ million tons per month have reduced domestic stockpiles to a dangerous low. Oil lends itself to all types of transport, although not always economically sound, and this flexibility has resulted in an unprecedented demand for this fuel. It may be recalled that the government practically ran the petroleum industry during the war. Immediately after, governmental sources were most prominent in forecasting a depression, unemployment and overproduction. Expansion of facilities was discouraged, but in spite of this, the petroleum industry has increased its producton over 30 per cent the last two years.

It is difficult to discern any advantage of one fuel over the other as far as reserves and transport is concerned. Each is plagued with the same problems. Each is trying to catch up with demand. From the economic standpoint it is rather amusing to note the manner in which the relative positions of the various fuels have shifted, from a number of factors including the machinations of old "Beetle-Brows". At this writing all evidence seems to point to coal as being the most *expensive* fuel and gas as the *cheapest!* With fuel oil weighing in at a slightly over the price of gas the wheel has come full cycle. It is a bit difficult to see how the coal people can base an economy sales story on coal that costs the poor, suffering consumer $16 to $20 by the time it is in his bin. In a way it might be all for the best that no one fuel is in a position to take full advantage of the present peculiar situation or that fuel could probably outdistance the others by so far that they would never catch up.

Although each fuel requires transport, fuel publicity this winter is apt to have a freezing effect on our industry's sales volume unless we make some contribution toward easing the situation. It has been pointed out that ten per cent increase in combustion efficiency will do much to relieve the critical fuel situation. This should be our objective. It means clean heating surfaces and expert adjustment of *all* furnaces: hand-fired, stoker, oil, and gas.

This we *ought* to do; this we *can* do; this is *our* responsibility.

Arnold Kruckman's

Washington Letter

Cost of "Marshall Plan"

ALL industrial groups which manufacture steel and similar metals again will be asked by the Federal Government to supply certain fundamental data about their current production, and about their ability to expand production if more metals are made available. The questionnaires probably will be in circulation by the time this letter is pubilshed. They will undoubtedly be sent out by the Department of Commerce under the sponsorship of the committee headed by Commerce Secretary W. Averill Harriman, who is chairman of the new body known as the President's Committee on Foreign Aid. The committee, composed of industrialists and business leaders of national conspicuity, is broken down into six subcommittees.

The subcommittees of interest to the sheet metal industry are those headed by John L. Collyer. president of B. F. Goodrich Co., which is devoted to a general classification of consumer goods, and by Hiland Batcheller, head of Allegheny-Ludlum Corporation, whose subcommittee is concerned with capital and durable goods. The first meetings of these committees have just been concluded here. The complete over-all committee, whose members also constitute the subcommittees, includes Batcheller, Collyer, Dean Robert Earle Buchanan, Iowa State College; Vice Chairman W. Randolph Burgess, National City Bank of New York; Secretary-Treasurer James B. Carey, CIO; President Granville Conway, Cosmopolitan Shipping Co.; Melville F. Coolbaugh, Golden, Colorado; President Chester C. Davis, Federal Reserve Bank. St. Louis; President R. R. Deupree, Proctor and Gamble; Paul G. Hoffman, Studebaker Corporation; Dean Calvin B. Hoover, Duke University; President Robert Koenig, Ayrshire Collieries Company; former Senator Robert M. LaFollette; President Harold G. Moulton, Brookings Institution; Dean Edward S. Mason, School of Business Administration, Harvard University; Secretary-Treasurer George Meany, A. F. of L.; Dean William I. Meyers, School of Agriculture, Cornell University; Dr. Robert Gordon Sproul, president, University of California; and Owen D. Young, General Electric Company.

Survey Already Begun

The subcommittees already have been making broad spot surveys upon which they have reported to the committee of the whole. The reports, after consideration, will be circulated among the units of the various industries for criticism and suggestions. Eventually it is proposed that the various industrial groups shall be asked how much volume of surplus goods they are now producing, and how much more they may be able to produce, assuming they would be able to obtain more materials. The program for the future is still undefined in details; but it is known that notable economists from the schools again shall do the spade work with the industrial groups embraced by the committees. Those industrial groups not specifically included in any subcommittee group are to be reached through their trade associations. The actual preliminary work upon which the investigation is based has been done by the several sections of the Bureau of Foreign and Domestic Commerce of the Department of Commerce. They have coordinated various previous enquiries and surveys such as the work done by Krug's Committee on National Resources. The purpose of the new survey is, of course, to determine how the economy of the nation can implement the Marshall Plan, when and if the Marshall Plan is put in operation. At present the keynote of the purpose of the committee appears to be to find out what it is possible to do without disrupting the price structure at home. and without diminishing the supply of goods for domestic needs.

Program of Possibilities

Obviously, the prospect is complex and unsure. The whole program is based upon potentials. It is an effort on the part of the administrative part of the Federal Government to get ready for an eventuality

which has not yet jelled. No one yet knows exactly what the Europeans will do about the Marshall Plan, although the word here is that the long-drawn-out preparation of the report by State Department Envoys Clayton, Douglas, Caffrey and Kennan, in Paris, has been lagging because the Europeans have apparently not been able to divorce their thought from the premise that the chief basis is what they can get from us rather than what they can do for themselves. It is said when the structure of their promise of self-help is so conditioned and qualified that our envoys are almost at their wits ends to present the picture in such manner that our Congress and our people will not make an uproar.

Cost of Aid

Apparently the European politicians, who stubbornly keep their backs to Eastern Europe, have worked out a program that would mean we must provide $30,000,000,000 during the next 5 years. This colossal amount is not likely to be accepted by the Congress, no matter how much intense preparations the State Department may make in the way of ominous predictions of catastrophes ahead. Congress has learned back home the people are cool towards more vast spending. Even the great drive for more food has not met with eager response; not, because the people are reluctant to help in the event of genuine need, but because they are doubtful and are extremely cynical about the propaganda from Europe, and even have doubts about the propaganda put out by our own leaders in Government.

When Congress finally meets in special session—in November—(which is anticipated as certain despite all statements to the contrary), it is almost certain a very strong element in the Senate, supported by a popular demand will press for the adoption of a plan that any major funds for the rehabilitation of the 16 European countries—and Germany—shall be drawn from private capital. It has been proposed, by a responsible group, that private sources be permitted to finance the economic rehabilitation to the tune of billions, as a pure business undertaking. with a guarantee by the U. S. Government against a certain percentage of possible loss. In the interest of this plan a group of citizens and members of Congress have been touring Europe, informally, with a small staff of competent experts to make a professional survey.

Agitation for Controls

Incidentally, if you are keeping a close watch on the news, you may have observed little fugitive news reports that have flashed from various parts of the country, suggesting that perhaps we will be compelled to help the European cause by tolerating certain limited controls and allocations in the distribution of domestic goods when the foreign aid program goes into operation. You may also see there are already cautious feelers intimating that certain simple and limited controls should again be placed on prices. It is patent that those who are fostering the foreign aid program realize that in many instances there are not enough supplies to provide the materials needed for the fat potential foreign market, and for the need of the people at home. Controls of some kind are therefore logical and inevitable. Tightening the belt to contribute food for Europe is just a preliminary move.

It is generally assumed here it will take Congress months to take the final vote. Something obviously will be done. Whatever the final outcome may be in terms of more or less exact equations, it is generally thought here that the crystalized, settled program will not be ready to go to the White House until next spring. In the meantime there will unquestionably be some immediate, temporary spot relief to meet the very desperate need of food that exists, and is growing, in Europe.

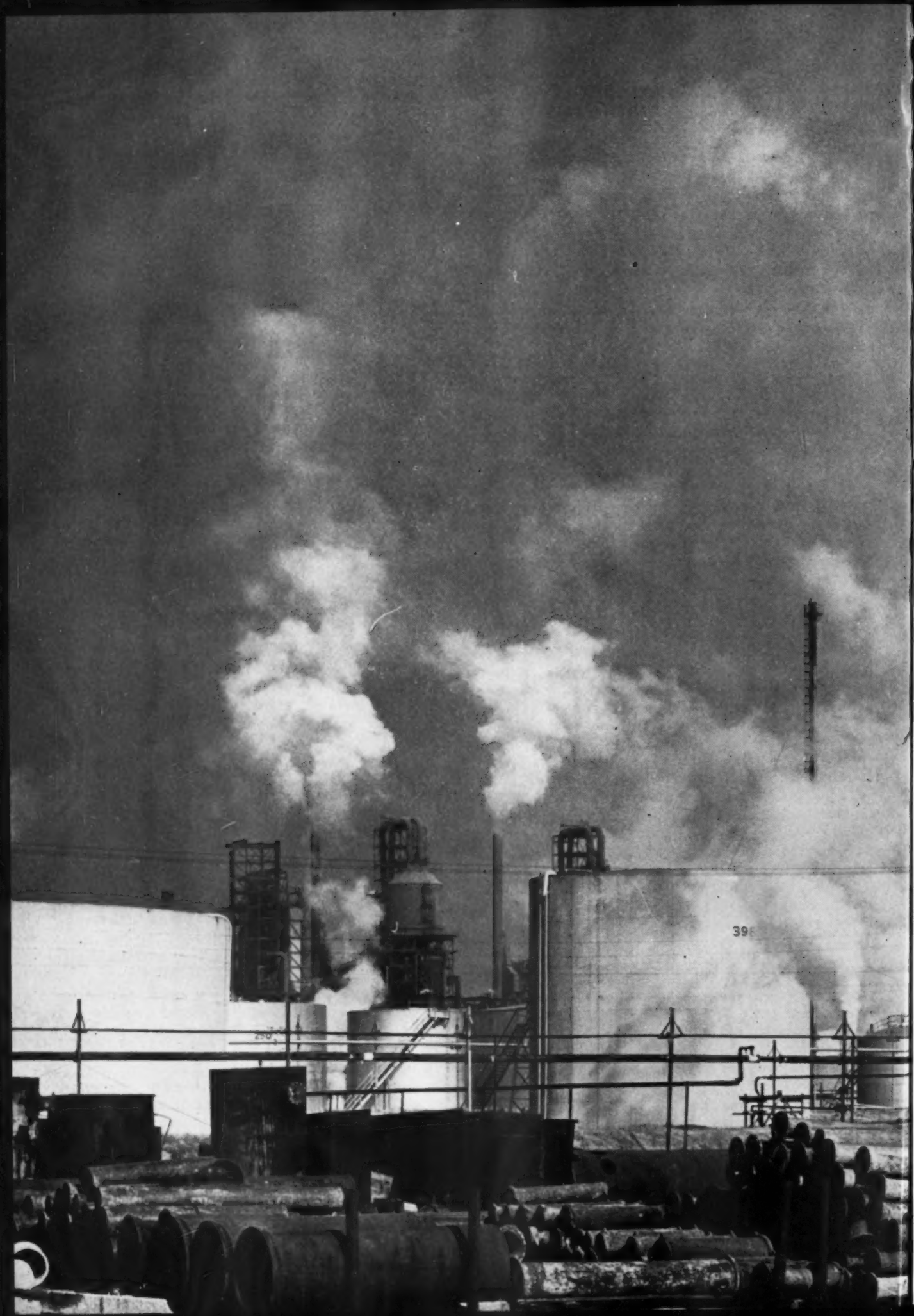
Hearings on Steel Export

The steel hearings by Senator Martin's subcommittee on steel of the Senate Small Business Committee has brought out the embarrassing fact, admitted by the steel companies, that during the first six months of this year, well over 10.5% of finished steel products were sent abroad. The Department of Commerce revealed the incontrovertible facts and figures that plainly showed 3,200,000 tons of steel products were shipped to foreign consumers. The figures were designated as alarming, both by the Department of Commerce Office of International Trade and by the Senate Small Business Committee. These figures made an uncomfortable moment for the great companies, such as the U. S. Steel, Bethlehem Steel and Republic Steel, whose officials, in all apparent sincerity, testified their direct exports had aggregated no more than 2,470,000 tons, or 7% of the total output. This state of affairs led one executive of a great steel corporation to analyze the situation by pointing out that the discrepancy unquestionably stemmed from the operations of the steel warehouses, distributors, and brokers, who patently have been channeling their generous allocations of steel, not in the domestic market as they had engaged to do, but into the far more lucrative foreign market where they obtained prices never less than double the prices they could legitimately get at home, but quite generally treble the domestic revenue. It was pointed out that this condition also explained in some sense some of the notorious grey market. The representatives of the great steel corporations urged the Senate Small Business Committee might get to the core of the squeeze on the domestic users by thoroughly investigating the deals made by the warehouses and other distributors.

New Export Regulations

Steel people hope that the new export controls on steel, which went into effect October 1st, will help materially to make substantially greater volumes of the metal available to the manufacturing and fabricating industries at home. They especially hope there will be a greater supply of sheet steel. The new export regulations cover approximately 50 major iron and steel products. The controls, administered by the Office of International Trade in the Department of Commerce, limit the volume that may be shipped abroad, and limit the number of countries that may receive the items, and define the end-use to which the steel may be put. The past year the export controls on

(Please turn to page 160)



Oil—Scarce in the Land of Plenty?

The Oil Heat Institute of America arrived at the conclusion that entirely too much unfavorable publicity was being given to the temporary dislocation known as the "Oil Shortage". To counteract it, the OHI asked the American Petroleum Institute to analyze the entire picture, demand, supply, problems and what the industry is doing to meet the problems. This article is the result of that request.

Demand

THE demand for oil products is setting new records and is substantially higher than even wartime requirements. In fact, the United States is now using as much oil as did the entire world about ten years ago.

So far in 1947, the domestic consumption of finished products, manufactured and refined, by the American petroleum industry is at the rate of about 574 gallons a year for every man, woman and child in the country. That figure is an increase of 110 gallons, or 23.7% over the 464 per capita in 1941, and 56 gallons, or 10.8% over the 518 gallons average in 1946.

This year's (1947) total demand, including exports, on the United States' petroleum industry for all oil products is estimated at 2,092,400,000 barrels (5,733,000 barrels a day) by the U. S. Bureau of Mines, an increase of 7.0% compared with the year of wartime peak demand of 1,955,668,000 barrels (5,358,000 barrels a day) in 1945, 7.7% more than the 1,942,165,000 barrels (5,321,000 barrels a day) in 1946, and 31.2% higher than the 1,594,609,000 (4,369,000 barrels a day) in 1941.

By principal products, the estimated 1947 demand, including exports shapes up as follows:

Gasoline demand is estimated at 825,600,000 barrels (2,262,000 barrels a day) an increase of 131,012,000 barrels, or 18.9% compared with the 694,588,000 barrels (1,903,000 barrels a day) in 1941 and an increase of 45,378,000 barrels or 5.8% over the 780,222,000 barrels (2,137,600 barrels a day in 1946.

Distillate fuel oil demand, the lighter types of fuel oil used for home heating, by utilities for gas enriching purposes and for Diesel engines, is estimated at 310,700,000 barrels (851,200 barrels a day) in 1947, compared with 272,318,000 barrels (746,100 barrels a day) in 1946 and 189,749,000 (519,900 barrels a day) in 1941.

Kerosene demand this year is estimated at 110,400,000 barrels (302,500 barrels a day) compared with 97,725,000 (267,700 barrels a day) in 1946 and 72,690,000 (199,200 barrels a day) in 1941.

Residual fuel oil, the heavy grade used by ships and industry, and some for plant heating, is espected to reach a demand of 511,200,000 barrels (1,400,500 barrels a day) in 1947 compared with 486,637,000 (1,333,300 barrels a day) in 1946 and 397,536,000 (1,089,140 barrels a day) in 1941. All other products, including lubricating oils, asphalt, coke, wax and crude oil used as such, etc., make up the remainder of the total estimated demand of 2,092,400,000 barrels for 1947.

The total domestic demand for all oil products in 1947 will be about 1,947,000,000 barrels (5,334,000 barrels a day) a new record. This would compare with 1,790,961,000 barrels (4,907,000 barrels a day) in 1946; 1,772,685,000 barrels (4,857,000 barrels a day) in 1945, the peak wartime year, and with 1,485,779,000 barrels (4,071,000 barrels a day) in 1941.

Export demand for American oil products is estimated at 145,000,000 barrels (397,300 barrels a day) for all of 1947 compared with 151,204,000 barrels (414,250 barrels a day) in 1946 and 108,830,000 barrels (298,200 barrels a day) in 1941.

Contributing to the record demands for products in the United States are several important factors, namely:

1. *Restoration of motor vehicle usage:*

As of June 30, 1947, registrations of such vehicles approximated 36,000,000 according to estimates, an increase of at least 1,626,998 compared with the 34,373,-002 registered on December 31, 1946, and compared with 34,842,847 on December 31, 1941, the prewar peak.

Broken down into various categories by the U. S. Public Roads Administration, as of December 31, 1946, the motor vehicle registrations included 28,100,188 privately owned automobiles, 119,937, buses and 5,725,-692 trucks. Federally-owned vehicles comprised 21,779 automobiles, 482 buses and 41,164 trucks, while vehicles owned by states, counties and municipalities comprised 91,369, autos, 53,166 buses, 219,225 vehicles of various kinds, including trucks. An accurate segregation of vehicles for June 30, of this year is not available.

2. *Large Military requirements:*

For military and shipping needs in the fiscal year to end June 30, 1947, the Army-Navy Petroleum Board estimates its needs at 81,800,000 barrels, (224,100 barrels a day) with some indications that these needs may be lifted considerably. The peak of military require-

ments during the war was reached in the early part of 1945 when it was at the rate of 1,600,000 barrels a day, for a short period, equal then to about 32% of the domestic industry's production at that time. In 1938, prior to the war in Europe, needs for the military services—Army, Navy, and Coast Guard—approximated less than 12,000,000 barrels annually, fluctuating slightly one way to the other, and equal to only about 14% of those for the current year.

3. *High level of industrial production:*

This high rate of production, according to the Federal Reserve Board, stood at an index of 186 at the end of May, last. It compares with a monthly average of 162 for all of 1941 and predicates a relatively corresponding increase in demand for heavy fuel oil and industrial lubricating oils, and gives impetus to the demands for other products. The demand for lubricating oils for industry over a period of years, for instance, has shown a similarity to the industrial production index. Needs for the current year are estimated at about 16,000,000 barrels of lubricating oils for industrial use, based on the index, which would compare with 14,300,000 barrels used in 1946 and with 14,400,000 barrels in 1941. These industrial demands for lubricating oils are exclusive of demands for automobiles, motor boats, tractors, and certain other internal combustion engines.

4. *Farm prosperity:*

A high level of farm income has enabled the purchase by farmers of considerable new equipment using gasoline, Diesel and lubricating oils. In the mid-west, as an instance, farm use of oil products has nearly doubled since just prior to the war. Attesting, in part, to this higher demand is the fact that there are now in use on farms approximately 2,700,000 tractors. It is estimated that these tractors will consume approximately 2,821,000,000 gallons of gasoline, tractor or Diesel fuel this year, an increase of more than a billion gallons, compared with the estimated 1,446,000,000 gallons consumed by approximately 1,783,000 farm tractors in 1941.

5. *Increased use of Diesel engines:*

Industry, railroads, buses and trucks are using more Diesel engines. At the beginning of this year, Diesel horsepower in use, exclusive of military, was estimated at 43,500,000 represented by 113,941 installations, which will use an estimated 62,000,000 barrels of Diesel fuel this year. In contrast, there were 19,920,000 horsepower in use in 1941, represented by approximately 22,100 installations, and fuel consumption approximated 24,800,000 barrels. The increase in demand for Diesel fuel in the period amounts to 150 per cent.

6. *Increased Burner Installations:*

The number of domestic and commercial installations for heating with oil is increasing rapidly. Installations of oil burners for central heating in homes and for small stores, using light fuel oil, were estimated at 3,100,000 as of June 30, 1947, which would compare with 2,821,044 at the end of 1946. On December 31, 1941, such installations amounted to 2,402,060.

Commercial heating installations, using heavy fuel oil, totaled 383,560 on December 31, 1946 (an estimate for June 30, 1947, is not available) compared with 287,595 on December 31, 1941.

7. *Increased demand for Liquefied Petroleum Gas:*

Demand for this gas, commonly referred to as "bottled" gas is by consumers in rural and small-town areas, as well as in some suburban areas, and large quantities are used by industry. In 1946 the estimated sales of this gas were 1,425,000,000 gallons, exclusive of amounts used for synthetic rubber, an increase of 29.5 per cent over the 1,100,000,000 in 1945, and 208 per cent over the 462,852,000 gallons in 1941. This product of the industry has experienced a rapid and substantial rise in sales each year since 1926.

8. *Aviation Gasoline Demand:*

Contrary to most other oil industry products, aviation gasoline demand has shown a decline since the war's end. From a demand in 1941 of approximately 50,000 barrels a day, the demand soared to 600,000 barrels a day in the second quarter of 1945. In the current year the demand has been approximately 44,000 barrels a day for the first four months, but it is expected that this figure will rise susbstantially henceforth.

9. *Miscellaneous Uses:*

New products are being developed constantly by the industry which, together with new uses for existing products, are adding to the demand factor. For instance, a relatively new market for kerosene is in the tobacco-growing industry where farmers are switching to this fuel in preference to wood for curing purposes.

Chemicals is another rapidly growing branch of the industry, although the volume of business done is only a small portion of the total petroleum business. During the war the industry was a principal supplier of butadiene, used in synthetic rubber, and of toluene, used in making TNT. The oil industry is an important source of other chemical products such as alcohols, glycerine, a large variety of petroleum chemicals used in making medicinal preparations and cosmetics, insecticides, weed destroyers, etc. The business in petroleum chemicals is growing steadily and it is becoming increasingly important.

This year's sales of outboard motors (fiscal year ended September 30, 1947) are expected to be triple those in the same period of 1941 when 167,000 were sold. In the 1946 fiscal year sales amounted to 202,000 units so that this year's sales will more than double that record. In the six months ended March 31, 1947, sales totaled 249,818 motors, according to the Outboard Manufacturers Association.

Supply

The supply of oil (technically stated: the supply of liquid petroleum hydrocarbons) is ample to meet the total demands in 1947 which are estimated at 5,733,000 barrels a day. Here is how the supply is made up:

Production of crude oil in the United States currently is running at the daily rate of about 5,100,000 barrels (average for the four weeks ended July 5). To this crude production is to be added approximately 362,000 barrels daily of other liquid hydrocarbons—natural gasoline and benzol—and customary imports of heavy fuel oils and crude oil which more than offset exports. These imports are expected to average 450,000 barrels a day, with crude production averaging 5,000,000 barrels a day *for the full year* 1947, and other liquid hydrocarbons averaging 362,000 barrels a day; an ag-

gregate supply of about 5,812,000 barrels is available to meet demands estimated at 5,733,000 barrels a day average for the full year.

Thus there is an ample supply of basic petroleum—crude oil and other liquid hydrocarbons—to meet the unprecedented demand for oil products, but facilities for gathering, transporting and distributing them are not adequate for the peak demands. The available facilities are being used at maximum to serve the public, the military and other customers.

Crude Production At Record

Current crude oil production averaging 5,100,000 barrels a day is a new high record. It compares with the wartime peak output of 4,944,250 barrels a day in the week ended July 21, 1945. On latest reports, there is additional potential production available at the present time of approximately 165,000 barrels a day in the United States but it cannot be moved to midwest refining centers in adequate quantities by means of already overloaded transportation facilities.

Production of 5,100,000 barrels a day of crude oil compares with an average of 4,749,000 barrels in 1946 (1,733,424,000 barrels for the full year) and with 3,842,000 barrels a day (1,402,228,000 barrels for the full year) in 1941. For the wartime peak year—1945—the industry produced an average of 4,695,000 barrels of crude oil daily, or a total of 1,713,655,000 barrels for the full year.

Proved Reserves Increased

The oil industry has been able, over the years, to increase its inventories of proved underground reserves. At the beginning of 1947 the country's proved *crude oil* reserves in the ground were at a new high record of 20,873,560,000 barrels. In addition there were 3,353,887,000 barrels of *natural gas liquids* (condensate, natural gasoline and liquefied petroleum gas) which would lift the total reserves to 24,227,447,000 barrels. Since figures are not available for December 31, 1945 to show total liquid hydrocarbons other than crude oil, a comparison of the reserve position can be made only in terms of crude oil, and the total of the latter at the beginning of this year shows an increase of 931,714,000 barrels, or 5% as compared with the end of 1945. At the end of 1941 estimated proved reserves of crude oil and condensates totaled 19,589,296,000 barrels including possibly 800,000,000 barrels of condensates. Thus, notwithstanding an unusually heavy drain on reserves during the war years, the industry was able to show an improvement in this position.

Refining Capacity Adequate

According to a recent report, the industry's refining capacity as of June 30, 1947, was estimated at 5,648,102 barrels a day, a clear indication that from an overall viewpoint there is no current shortage of refining facilities in this country. Some of this capacity, however, is shut down because it is badly located from a transportation viewpoint, or partially or wholly obsolete, or unable to handle the high sulfur crudes which are available.

In the four weeks ended July 12, last, the refining division of the industry was operating at 90.8% of capacity and processing an average of 5,127,000 barrels of crude oil daily. This rate of operating marks a new record, and is an increase of 33 per cent compared with the average daily runs to refineries in 1941.

Aside from the current refining production, the industry has substantial inventories of refined products—240,907,000 barrels, including natural gasoline at the end of April, 1947, and slightly higher today. These refined products stocks, however, are not distributed uniformly throughout the country and because of transportation shortages mentioned previously, temporary exhaustions of inventories of gasoline and burning oils are anticipated in local areas, especially in the midwest.

New transportation facilities, as well as other construction, are under way but with materials shortages and slow deliveries very little new capacity will become available before the end of 1947, so that the problem currently is one of maximum utilization of existing equipment.

There is an urgent need for additional movements of crude oil and products into the middle west. The high rate of refinery operations there has reduced crude oil inventories sharply in the past year. At present the industry there is processing about 1,300,000 barrels of crude oil a day, but crude production in the area has actually declined since 1941, and a gap of about 340,000 barrels a day between nearby production and refining operations has developed. To fill this gap requires the transportation of large additional amounts of crude oil into the middle west from other areas.

Present pipe lines to that section are operating at capacity. Additional supplies are being moved by barges and tank cars.

New Pipe Line Capacity

Pipe line capacity is being expanded to the middle west from west Texas and about 60,000 barrels a day of capacity is expected to be in operation by the end of this year, with perhaps another 250,000 barrels a day in operation sometime next year. All refineries, however, do not have adequate facilities for processing high sulfur-content West Texas crude oil. Such crude requires special alloy steels and it will be sometime before the necessary refinery modifications can be made.

Several mid-west refiners which are now equipped to process this crude oil are obtaining large quantities from West Texas by tank car. This form of transportation requires higher costs than would be justified under normal conditions. Some West Texas crude also is moving to Gulf Coast refineries for processing. The West Texas area, incidentally, is one where additional supplies of crude oil are available. For the southwest area it is estimated that about 128,000 barrels a day of additional crude oil could be supplied if additional transportation were available.

Sectional Differences in Supply-Demand Situation

Middle West: Several middle west companies recently were forced to allocate gasoline supplies to jobbers and distributors in twelve states during part of June, and all of July and August. Because transportation problems are intensified there, the middle west is the most critical area in the country. The high demand in this region is attributed to:

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WAGE INCENTIVE PLANS

Basis for Wage Incentives

WAGE incentive plans are methods of paying workers in some degree for their effort, rather than of paying them on the basis of the time they spend at work. Wage incentives permit substantial increases in wages and effect significant decreases in the unit cost of production; thus they conform to the national stabilization policy.

In an ideal industrial society each individual in management and labor would desire to think and work up to his capacity. There would result the best of engineering, plant lay-out, scheduling, working conditions, production and earnings. There are probably a few instances where, through inspired leadership and excellent cooperation, this condition is approached. However, as a nation, notwithstanding our remarkable over-all accomplishments during the war period, we are actually far from this ideal condition.

Profits and the possibility of salary increases have been the chief means of encouraging management to do its best. Wage incentives were established to provide the seemingly necessary motive to create a desire among workers to increase their productivity.

Incentives not only offer inducement, but provide a demonstration of urgency. They are a time-tested way to get better results. They are traditional in the American system.

Development of Plans

Wage incentive plans are not new. They were introduced in American industry in 1895 by Frederick W. Taylor, called "The Father of Scientific Management."

Earlier in the industrial era, what is ordinarily known as "day work" was the prevalent method of wage payment. Although this system took care of presence on the job—the phrase "services performed" included the condition of being present and available for duty—it left unsettled the question of what constituted a fair day's work.

When industry began to strive for more production and lower costs and as workers showed a willingness to produce and a desire to be remunerated for extra ability, there came, toward the beginning of the present century, an increase in the use of contract work or "piece work."

Prior to World War II, the Federal Government had little interest in wage incentives in private industry, except through its efforts to work out by mediation the difficulties that arose from the improper use of incentives. The work of the Textile Work Assignment Board is an example.

Reprinted from WPB "Handbook of Wage Incentive Plans."

The general textile strike in 1934 was based largely on union charges that some mills were using a "stretch out"—that is, allegedly were setting work assignments that were too large.

A Textile Work Assignment Board was appointed by the Federal Government and studied the problem for about 6 months. The results clearly indicated that measurements of work assignments or corresponding wage incentives must be worked out locally, because standards and methods broadly planned to cover varying conditions could be entirely unjust and inappropriate.

The following statements of the Textile Work Assignment Board are of interest as the recommendations of a Government agency.

1. The work assignment is not merely a specification of the facilities for doing work—machines, equipment, and work places. Work assignment is a quantitative statement of the results desired from the worker or, that is, the actual amount of work required or expected to be done in a specified period of time. In practice it must be expressed in terms of machines to be operated at some standard rate of efficiency.

2. Work assignments should be based upon and measured by the actual amount of work required in their performance. No assignment should be such that a normal employee cannot handle it day after day and year after year without impairment of his health and energy.

3. Work assignments should be so regulated as to eventually remove this subject from the field of competition; mills should not be driven to seek removal of competitive disadvantage through any course which jeopardizes the well-being of their employees.

4. No barrier should be raised against the introduction of new machinery, nor against the improvement of processes. Such progressive steps, however, should be accompanied by measures which will minimize the hardships imposed upon the workers displaced.

Since that time the Conciliation Service of the United States Department of Labor has done considerable work in assisting management and labor in solving work-assignment and incentive difficulties.

As management and labor consultants of the Office of Production Management, which preceded the War Production Board, worked on the problem of settling labor disputes, actual or potential, which threatened to interrupt war production, it became increasingly clear that questions relating to the amount of work which labor should accomplish and how much the worker should receive per day were at the bottom of

(Please turn to page 146)

NEWS SUMMARY OF THE MONTH

Warm Air Furnace Shipments

FACTORY shipments of warm air furnaces in July totaled 56,462 units according to the Bureau of Census. Approximately 75 per cent of all furnaces shipped in July were of steel construction; the remaining were cast iron.

Solid fuel furnaces represented 45 per cent of the July shipments; oil-fired, 38 per cent; and gas-fired, 17 per cent.

Fractional HP Motor Output

PRODUCTION of fractional horsepower motors, used in industrial, farm, and home applications, has been boosted to an all-time high. But supply has not yet caught up with demand for certain types, even though output this year will be considerably above the average rate for the prewar years. Motors rated from 1/6 to 1/3 hp, used for fans, blowers, and similar applications, are still in short supply.

Warm Air Exports Decontrolled

EXPORT controls on several building materials including warm air pipes and fittings were terminated October 1, according to a Department of Commerce report. The department announced current supplies are adequate for domestic housing needs.

Installment Curbs Off Nov. 1

ONE of the last of the remaining business curbs—Regulation W—will end November 1. Congress refused to enact permanent legislation controlling consumer credit and future credit curbs can be invoked only in event of war or national emergency.

State of the Nation

PERSONAL debt reached a new high at the end of June. The Institute of Life Insurance estimates it at $45 billion, $3 billion more than six months earlier. Biggest single increase was in mortgages on non-farm houses which totaled $27 billion. Short-term consumer debt outstanding is slowly approaching its prewar relationship to disposable income. At the end of July, it amounted to $11.1 billion, 0.9% more than at the end of June and 38% higher than a year ago.

Personal income reached a new high during July. At the annual rate of $196.9 billion, it was 11% higher than a year ago. The gain of 0.9% in July was due to silghtly higher wage and salary payments, higher farm income and increased veteran's state bonus payments. "Real" income, however, was still slightly below a year ago.

New Housing Agency

A NEW permanent Housing and Finance Agency responsible for the general supervision and coordination of the Home Loan Bank Board, the Federal Housing Administration, and the Public Housing Administration has been established under the President's Reorganization Plan.

Administrator Raymond M. Foley recently announced the new agency would concern itself with basic problems in the housing field, such as costs, financing, appraisal standards, housing statistics, and new technics and materials that become available to industry.

Catholic Construction Program

A MULTI-BILLION dollar construction program covering every phase of Catholic parochial and institutional building lies in the immediate future.

Much of the year to year building that ordinarily would have been completed since 1941 is expected to be started as quickly as the necessary materials and equipment are available. However, the full movement of all Catholic construction projects may not get under way for considerably more than a year.

To prepare for a better understanding of the problems involved in these projects, the National Catholic Building Convention and Exposition has been announced by the Very Rev. Henry A. Lucks, president of the convention and exposition, for next June 30, July 1, 2, and 3, at the Stevens Hotel, Chicago. The program planned for the event will cover every phase of building and remodeling churches, schools, convents, hospitals, colleges, etc.

Coal Production Statistics

PRODUCTION of coal was the subject of a bulletin issued by the National Coal Association released on September 20. Optimism was displayed over the fact that there had been 425 million tons of coal mined between January 1st and September 13th of 1947. This figure exceeded that of the previous year by 60 million tons. This is partially explained by the strike in 1946.

Forecasts of production indicate that the total for 1947 should be about 590 million tons, though 600 million might possibly be reached. Exports may total 40 million tons for this year unless there is some curtailment. Even with all these figures it is still ascertained that production is running at least a million tons less per week than it should. The explanation given for this is the shortage of coal cars at the mines and the shorter work-day under Mr. Lewis' latest "magna carta." Opinion seems to be that there will be no shortage of coal, as such, though particular types may occasionally be difficult to obtain when desired.

Decontrol of Oil Burner Exports

THE Department of Commerce feels that it is too soon to appraise the full effect of decontrol but third quarter figures, which will be completed soon, may aid in clarification.

The Department estimates that total oil burning exports should reach approximately $20,000,000 for 1947 and that figure would be the equal of the total exports for all the past fifteen years, 1932-1946.

Although many countries badly need oil burners, exchange in general is tightening and the Department suggests that manufacturers should carefully study the exchange situation well in advance. Housing continues very short in the European countries and there is evidence of effort, on the part of Commerce, to try and effect a solution to the increasing exchange difficulty so as to make it possible to continue shipments of housing materials, oil burning equipment included, if other lines are pinched off, as it presently appears many will be.

Despite comment about Canadian oil supply, and Government attitude on new installations, that country still remains our best customer for burners. The possibility that equipment is being re-exported to sterling countries has been checked. The total Canadian export of all products, (stoves, lamps, etc.) using petroleum of any grade in refinement totaled only $466,688 in these six months, which makes it obvious that the equipment is staying in Canada.

8th International Exposition

EVERY known device for improving indoor comfort will be represented at the coming 8th International Heating and Ventilating Exposition in Grand Central Palace, New York, February 2-6, 1948. Many will be entirely new, others strikingly improved.

So rapidly is the pace of science accelerating new developments in air conditioning for popular indoor comfort and also in the fast growing field of industrial air conditioning that the American Society of Heating and Ventilating Engineers sponsored a plan to hold the nation's leading air conditioning show annually until 1950.

Panel heating, the heat pump and other new heating and air conditioning applications promise to enliven technical interest in the exposition.

The show will be closed to the public.

Electric Radiant Heating

THE Department of Commerce reports experiments involving the use of electrically heated panels are now going on. A rubber compound covered with ground carbon converts the electrical energy to heat. When sandwiched between plastic panels, the combined unit may be installed in the walls or ceiling and so, becomes a radiant panel. Room temperatures are controlled by thermostats in each room.

The report points out that operating costs are not yet known.

Dealers Organize 24 Hour Service

COAL Heating Service of Greater Detroit, an organization of stoker and furnace dealers, has established a central 24 hour furnace and stoker service with a central telephone number that can be called any time of the day or night from any point in the Detroit area. Previously, a round the clock service was non-existent except that furnished by a few scattered independent dealers. In making a 24 hour furnace and stoker service a reality, the organization recognized that some members had existing facilities for such service, while others preferred to avoid the service function without antagonizing their customers. The announcement describing the plan points out that all dealers are satisfied with the arrangement and that the public is served with an invaluable assistance in time of emergency.

A.G.A. Gas Heating Forecast

GAS companies estimate 1,875,000 gas-fired house heating units will be sold in the three year period 1947 to 1949 inclusive, according to a study recently completed by the American Gas Association. The estimate was based upon replies received from utilities who serve 81 per cent of the total residential customers of the gas industry and who were queried by questionnaires mailed in January 1947.

In making the estimates of gas equipment to be sold in their territories, the utilities were asked, in the case of house heating units, to limit the estimates to the number of heating customers which they would be able to serve.

The estimates for gas-fired central house heating are as follows:

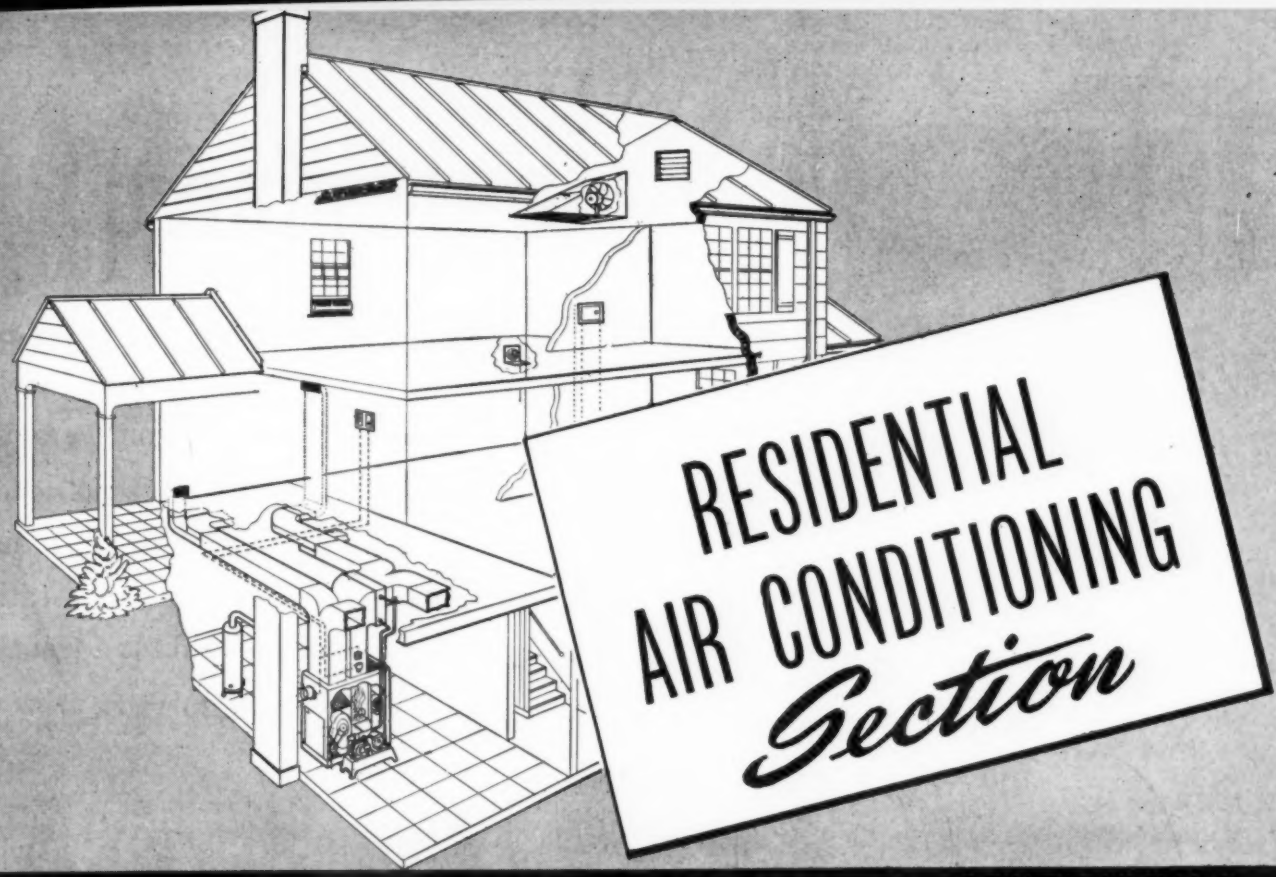
	1947	1948	1949
Floor Furnaces	220,900	241,600	242,100
Warm Air Furnaces	201,100	217,200	232,300
Boilers	23,200	34,000	33,100
Conversion	97,900	147,500	168,000
Air conditioners	3,400	5,600	7,700
Total*	546,500	645,900	683,200

**Excluding bottled gas units.*

Fate of the Wholesaler

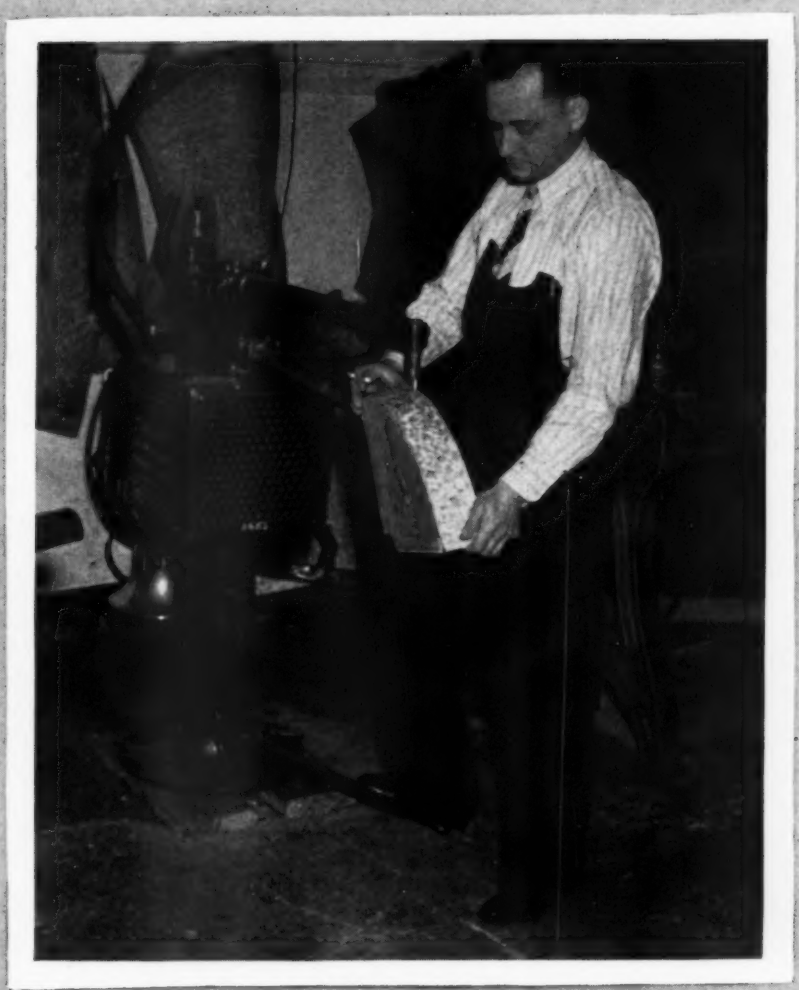
AN INTERESTING trend to watch in merchandising will be the fate of the wholesaler (jobber, etc.) in the present-day distribution system. Before the war there seemed to be a long term trend against this segment of the distribution system and during the war greater damage was wrought to his cause. However after the war ended the wholesaler seemed to make a strong come-back. (Wholesale sales in the first half of '47 were 89.8% of manufacturers' sales, against 94.2% in '40). The number of wholesalers had dropped from 145,000 in 1939 to 115,000 in 1943 but has been rising steadily and at the end of 1946 stood at 169,000.

The basic question in regard to the wholesaler seems to be: *in the given trade situation, can the producer or retailer perform the wholesale function more efficiently and at lower cost than wholesale companies?*



RESIDENTIAL AIR CONDITIONING *Section*

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING



Waterbury

Oil Fired Air Conditioner

Whether you are installing a simple gravity job or the most complete air conditioner, it's what's under the casing that counts for your customer's satisfaction—and for a trouble-free sale for you.

It's What's Under the Casing that Counts!

A modern compact, attractive unit, economical to buy—economical to operate. It is enclosed in an eye-appealing casing that is a compliment to the most modern basement—but what is equally important to you—because of the efficiency and quality of what is UNDER that casing, you are saved annoying service calls.

Furnaces for every size home and every type fuel — from gravity models to complete air conditioners.

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E. Minneapolis 13, Minn.

Correct Practice In Oil Heating

Part IX { *Banishing the tank hum—Importance of proper oilpipe dope—Some tips on tank installation—Placement and piping to outside tanks.* }

By J. J. Mirabile

Vice President of Engineering—Harold E. Sweeney Corp., Philadelphia

A TANK hum is a very annoying noise caused by a sound which comes from the tank and can be heard all over the house when the burner is running. Some oil pumps have a built-in diaphragm to overcome this condition. However, if your burners have a "habit" of creating tank hums, then use an anti-hum valve (Fig. 1) in the oil line between the oil line valve and the oil burner. The anti-hum valve is a valve in which a ball is used similar to a ball in a ball check to close the valve port. The valve stem is short and a spring between the stem and ball is used to create the desired tension. It also functions as a ball check valve permitting the fuel oil to travel in only one direction. The spring which is between the valve stem and ball can be adjusted to give the right tension on the ball to create the desired vacuum in the suction line. A vacuum gauge should be used in the line, and with the burner running, turn the valve stem until 1-1½" of vacuum is created in the suction line. The theory behind using the anti-hum valve is that sound will not travel through a vacuum. The oil line being under a vacuum of 1½" will prevent the pump sound from traveling back to the tank where it would be amplified.

This will eliminate the hum on one pipe jobs (we never had this anti-hum valve fail on hundreds of installations). In fact it is possible to hear the noise die away as the vacuum is increased. Do not use more vacuum than necessary to overcome the tank hum. After setting the valve, remove the anti-hum valve handle and vacuum gauge. (Fig. 2) Do not leave the gauge in the line. The customer will watch this and if it varies ¼" vacuum he will think something is wrong. He will then phone for a service man. The removal of the gauge eliminates this source of service calls. The Sundstrand Anti-hum device is available for suction and return pipe hum. This device is very practical and requires no adjustments.

Oil Pipe Dope

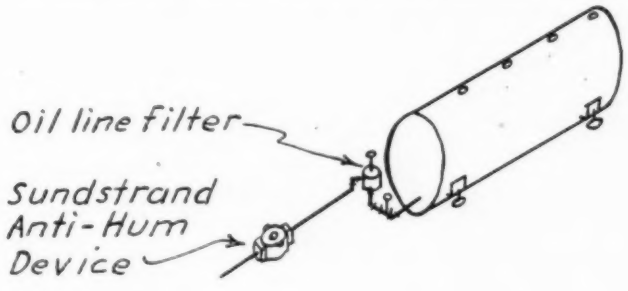
Fuel oil has a tendency to thin out pipe thread compounds (called pipe dope) and unless a pipe dope which will withstand fuel oil is used, oil leaks at the joints will become very annoying. Many pipe dopes may be excellent on steam, water, air piping, etc., but they may not be practical for fuel oil use. Always buy pipe dope which will withstand fuel oil.

Some firms use Permatex, Plasgon, Key Paste, etc. as standard oil pipe dope. The point to remember is that good oil pipe dope is inexpensive if it helps prevent oil line leaks.

Even a small oil line sweat may cause a slight oil odor. The customer will call for a service man to correct this condition. Eliminate this source of probable service calls by using good oil dope when making the oil burner installation.

Tank Installation Tips

The procedure to follow in installing the oil tank is to screw the tank legs and floor flanges on the tank while it is down on its side. Set the tank up and push the tank into place. Level it so it will not wobble. Then mark where opening must be cut in the outside wall for the fill and vent box. Move tank and cut hole. After cutting the hole in the outside wall, paint side of tank



Sundstrand Anti-Hum Device in suction line. May be used in noisy return lines. No adjustments necessary.

Fig. 1

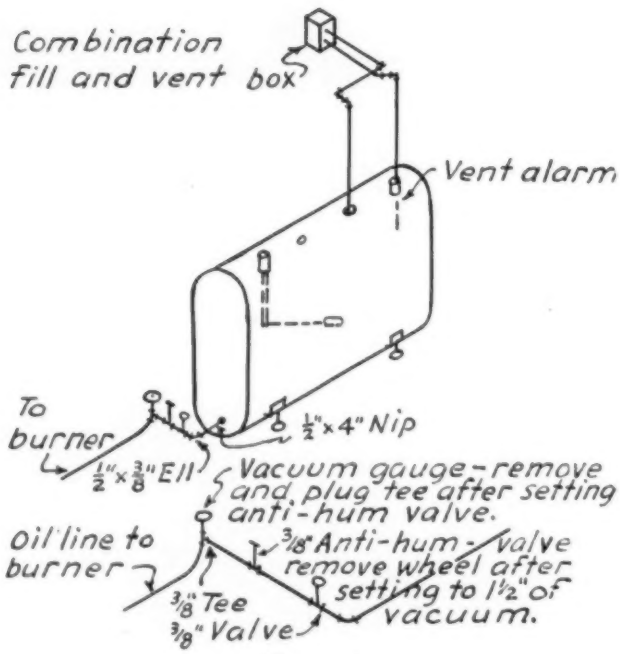

Combination fill and vent box
Vent alarm
To burner
½"×4" Nip
½"×⅜" Ell
Vacuum gauge-remove and plug tee after setting anti-hum valve.
Oil line to burner
⅜" Anti-hum valve remove wheel after setting to 1½" of vacuum.
⅜" Tee
⅜" Valve

Fig. 2.

which will be against the walls, then push tank into place. If you are to order oil at once, screw the oil line fittings and valve into the opening at the bottom of the tank; you may now order oil. If the oil arrives before your fill line is finished, truck oil hose can be passed through a window to fill the tank. You may continue to complete your piping after the oil delivery. This will assure you fuel oil ready to start the job after the installation is completed. Install oil line filter and then cut trench in concrete floor to bury the oil line to the burner. (Do not cut waterproof concrete floors). If the burner has been set at the furnace, run the ⅜" OD copper tubing over to the oil burner; cement the oil line.

Cement over the oil line from the tank to the oil burner. Cement around the fill and vent pipe opening in the masonry, also around the tank legs if any "building" up was necessary to make the tank legs "steady" without any tank wobbling. Clean up all the debris the tank man may have created. Also remember to clean up the dirt outside of the house under the fill and vent pipe opening. Complete painting up the tank, fill and vent piping also piping around the oil line valve and filter. Paint the fire and clean-out doors on the furnace. Also paint the asbestos coating over the front red brick wall which was built to close the ashpit opening.

Outside Tank Installations

Before installing your first outside tank, it is best to consult the local governing authorities and avail yourself of their code of other regulations which must be complied with and adhered to by your men. The distance the tank must be from building foundation is determined by the size of tank and the depth necessary to bury the tank. Local regulations specify these distances to prevent settling of nearby masonry walls, etc.

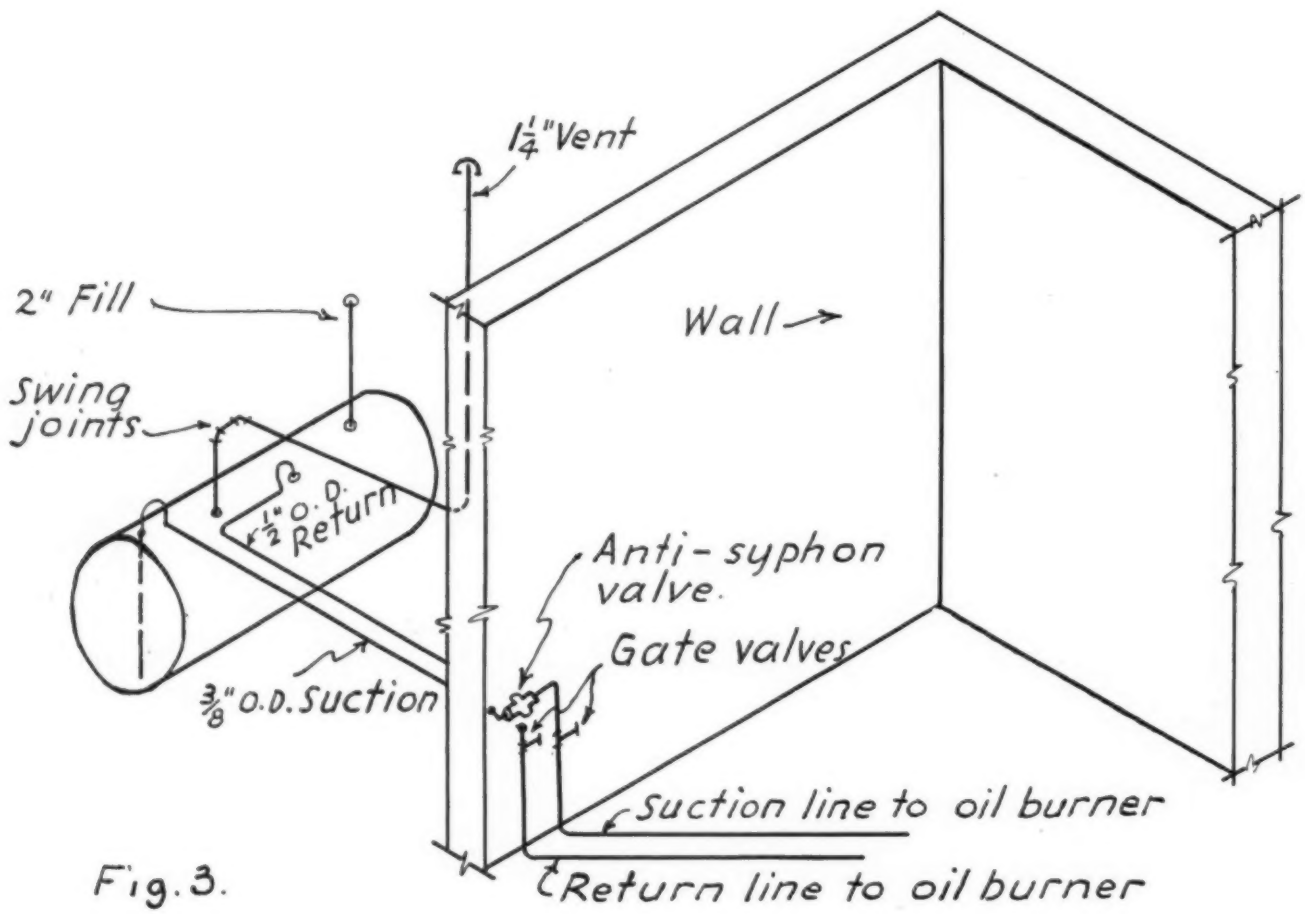


Fig. 3.

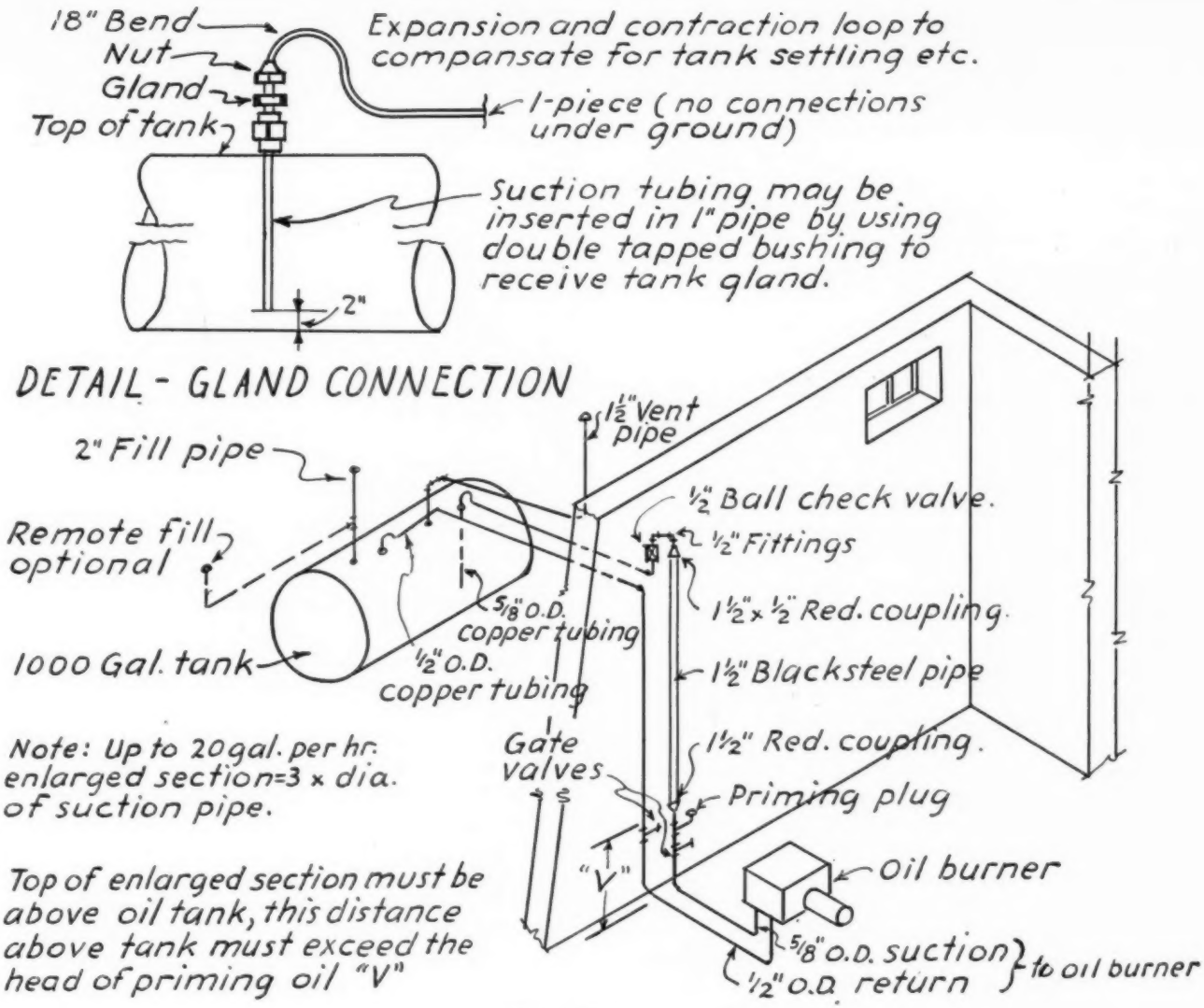

18" Bend
Nut
Gland
Top of tank
Expansion and contraction loop to compansate for tank settling etc.
1-piece (no connections under ground)
Suction tubing may be inserted in 1" pipe by using double tapped bushing to receive tank gland.
2"
DETAIL - GLAND CONNECTION
2" Fill pipe
Remote fill optional
1000 Gal. tank
1½" Vent pipe
½" Ball check valve.
½" Fittings
1½" x ½" Red. coupling.
1½" Blacksteel pipe
1½" Red. coupling.
Priming plug
Oil burner
5/8" O.D. copper tubing
½" O.D. copper tubing
Gate valves
"V"
5/8" O.D. suction
½" O.D. return
to oil burner
Note: Up to 20 gal. per hr. enlarged section=3 x dia. of suction pipe.
Top of enlarged section must be above oil tank, this distance above tank must exceed the head of priming oil "V"

Fig. 4.

The top of the tank should have a 2 foot thickness of earth covering it. This is to comply with NBFU regulations.

In localities where water is encountered in the earth which may cause an empty fuel tank to break its piping connection and rise up out of the ground, a reinforced concrete slab over the top of the tank will hold it in place. To determine the required weight of the slab, proceed as follows:

Capacity of tank in gallons x weight of fuel oil in gallons equals weight of concrete slab. Therefore for a 1000 gallon tank figure as follows—1000x7.9=7900 lbs. of slab. To comply with NBFU regulations the reinforced slab must not be less than 4" thick. Having determined the weight of the slab, place the tank in the ground opening and tamp the earth all around the tank, after making all piping connection. Place at least 12" of well tamped earth on top of the tank. Before pouring the concrete be certain that the slab will extend at least 1' beyond the tank in all directions.

Outside Tank Piping

In all outside tank jobs the tank piping must be tight. A leaking suction line will cause a lot of trouble. Sometimes the suction line loses its suction momentarily and the pump or burner is blamed for this difficulty. The best way to eliminate underground leaks is to install a suction line without underground pipe joints or connections. This is possible by using a tank gland connection (Fig. 4). This fitting permits inserting the tubing through itself without cutting the tubing. The tubing will then be one piece from inside the building to where it ends 2" above the tank bottom. Use a check valve inside the building; do not use foot valves in the tank. Use an Antisyphon valve (Fig. 3) or an antisyphon enlarged pipe system (Fig. 4) where the tank is above the burner. This is to prevent the syphoning of fuel oil through a broken pipe or other connection.

The vent pipe must be made of at least 1¼" pipe. It should pitch so that it will drain down towards the

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Profit Possibilities in Filter Service

By R. C. Nason

EVALUATING accurately 10 years ago the substantial profit possibilities in connection with air conditioning and more particularly the sectional filter division of it, former sheet metal contractor F. A. Borghoff established the company now known as National Filter Service Co., with a two-story plant in West New York, N. J. Here the proprietor and his five sons not only sell a huge volume of filters but recondition and clean an even greater number of units under a unique plan of operation.

The preferred class of customer prospect is the large chain store owner. Just now National has several with branches as far west as Denver. Some such customers require the reconditioning of as many as 500 units monthly. Mutiply this figure by several hundred customers and one obtains a fair idea of the enormous turnover in the course of a year. Some years the total has approached one-half million filters.

The business started modestly as a sales agency for "throwaway" types of filter. Soon the company received inquiries as to cleaning, reconditioning and re-installing of filters. This appeared a likely opportunity for profit, so National went into the cleaning business in a big way. To cope with the demand it was necessary to install vats, for immersion, steam lines, compressed-air lines, hot water equipment with hose connections, suitable piping and other equipment so that any known type of filter could be handled. An increasing number of applications, as to variety and scope, force the filter-cleaning facilities to expand constantly.

Types of Filters Handled

National encounters in a day's run viscous and dry, wet types, those of glass, steel wool, mesh and many other sorts of filter media. The business though including both selling and reconditioning service, places more emphasis on the latter. To cope with the call several types of contract are offered with a blanket order the favorite. National has many such agreements.

Most blanket orders cover large customers with branches, such as restaurants like Childs, Savarin and others. The contract drawn up proposes to provide clean filters at all times regardless of how many branches are served or where they are located. Often the interval for furnishing is specified and regular. Sometimes execution of the order depends on the operating engineers. In either case, however, it is evident that the users have to have fresh units to use while the dirty filters are being processed. Many times the sales of the reserve stock have been made by National.

Mode of Delivery

Following reconditioning of the work the company's trucks deliver and reinstall if distance is not over 50 miles. Otherwise they are shipped. But this, again, depends on the volume of work covered in the order. If the number of filters concerned is large the company has frequently trucked and reinstalled at distant points. Usually the customer pays incoming transportation and National pays return transportation. This arrangement applies to remote-located points and, of course, is subject to change. A flat cleaning charge per filter is made.

With a large number of customers in the Greater New York area, the filter company when servicing customers often sends along clean units and installs them when removing the dirty units for reconditioning in the New Jersey plant. This requires three trucks at present and a motor cycle sidecar for rush calls.

Cleaning methods actually employed are considered private, though they follow manufacturers' recommended treatment as a rule. This refers mostly to composition of the solvents used in the baths in which units are immersed for separating the dirt. Detergents, live steam, hot water and chemicals of varied sorts have to be used. In the case of viscous filtering media it is essential to renew the oil, which is done by means of power spraying. The company makes the claim that the reconditioned filters are as efficient as when originally installed. The fact that business has grown might be taken as evidence to bolster the statement.

Dry Cleaning

In the case of fibrous glass and certain other media found in "throw-away" types of filter the methods of cleaning are usually "dry". That is, filters are not immersed, though the service company has also experimented successfully with laundering them. Tapping and vacuum cleaning are the recommended methods of the manufacturers. With general types of throwaways however, merchandise profits may exceed reconditioning profit. This occurs in connection with banked, herringbone installations.

In banked applications of sectional filters the outer

The "shake-out" method of filter cleaning illustrated requires considerable manual dexterity.

units receive the bulk of the dust and the greater wear and tear so National Filter Service favors discarding the outer sections, shoving inner ones towards the exterior then selling and installing new units as replacements. In this operation there are suitable labor profits to be obtained. The company also may realign the framework that holds the filters in position.

We have mentioned an instance of the chain restaurateur as a good business prospect. There are many other chains equally susceptible to this sales story. National's customers, for example, include many insurance companies, mercantile stores, grocery chains and others. There might be listed, too, railroad terminals, hospitals, schools. The total runs into the thousands of prospects.

Many of today's customers are industrials who compose an ever growing air conditioning field. Users include candy manufacturers, food processors, packers, printing, textile, chemical plants, many others. Lately plastics producers have posed many a problem for air conditioning engineers due to the nature of the ingredients that go into such substances. Often it is sticky and gummy, injurious to health. Such manufacturers always are good filter prospects.

"But how do you know when to service, what intervals to allow between pickups?", the company was asked. "In some cases we have definite orders to recondition every 10 days, 30 days, etc. In other cases engineers time their calls with reference to air pressure gauges on their conditioning plants. If they see that the air pressure, meaning air supply also, has fallen off engineers know that filters are dirty, have retarded air flow and supply, so they ask for cleaning and replacement service."

Filter Cleaning Saves Money

It is instructive to learn, too, that several customers, notably department stores, make a point of scientific housecleaning. By means of redecorating, exhaustion of curtains, repainting requirements and the like, as reflected in operating costs on file, it is demonstrated that filter cleaning every 10 days more than repays the cost of the service. The National organization has made potent use of such figures.

Coupled with such operational savings there must be included other cost items like labor cost of cleaning crews, when the work is handled on the premises, the investment required for maintenance of suitable cleaning equipment, extra power cost due to extra loads placed on fan motors with dirty filters. Then there's the matter of air conditioning results, that is, contrasting the relatively inefficient results when using dirty filters and when they are clean. By employing an outside cleaner who renders prompt service cost is held to be no greater, conditioning superior, because the unpleasant task has been done at the critical time of need by experts.

Use of these and like selling appeals has enabled the Berghoffs to set up and keep active a brick plant 60 ft. in frontage and 150 ft. deep. Many present customers, too, have been on the books since the inception of the company.

Timing Is Important

Timing of service periods, it must be understood, is variable and depends on several factors such as the general air of the neighborhood, whether supply-air comes from the ground or roof level, type of occupancy, even the nature of the filter media. Oddly, the more efficient the media the quicker it clogs, hence the oftener it has to be cleaned. This is because efficient filters load up more readily, as is easily understandable.

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Another effective means of cleaning filters is by use of a vacuum cleaner, as shown.

Solving The Problems of Gas Heat

By C. L. Benn
Supervisor, Utilization Engineering
Equitable Gas Co., Pittsburgh, Pa.

THE maximum owner satisfaction attainable from an automatic gas fired heating system is not reached in many installations due to the "full on" and "full off" control systems usually specified or supplied with the gas fired equipment. These on and off controls result in what is termed "cold 70," underheating during the off period, overheating during the on period, air stratification and drafts.

Specifically, when the desired room temperature is reached, the thermostat shuts the gas off, but heat continues to flow from the furnace, up the warm air supply pipes and into the rooms in the case of gravity warm air systems, or the blower continues to operate, discharging warm air into the rooms in the case of forced warm air systems. Thus the room temperature continues to rise above the desired setting of the thermostat and a period of overheating results. After a time, when the room temperature drops to or slightly below the desired thermostat setting, the gas control valve opens and the burner ignites from the pilot. During this period, the entire system has cooled, including the heating surface of the furnace. There is a considerable time lag before the heating surface heats up and warm air again flows up the leader pipes of a gravity system, or until the bonnet temperature is built up to the temperature at which the blower in a forced warm air system again starts to operate. Thus underheating results during the off period. In addition, during the off period, the air in the distribution system having cooled to a point where circulation stops, the room air becomes stratified. The lighter warm air rises toward the ceiling, the cooler air settles toward the floor. The temperature differential between the floor and ceiling increases, with perhaps 64° F. to 65° F. at the floor level and 75° F. or above at the ceiling. The cold air along the floor results in discomfort, cool air from the windows, doors and outside walls drops to the floor and drafts are created. If the off period is long enough for the walls, furniture, etc. to cool, the bodies of the occupants lose heat by radiation to these cold surfaces, and they may not be comfortable even though the air temperature is up to the comfort level.

Therefore, the problem is to overcome the following undesirable conditions due to on and off control:

1. Overheating during the on cycle.
2. Underheating during the off cycle.
3. Stratification.
4. Drafts.
5. Excessive radiation loss to cold surfaces.

Manual Controls

A simple way to eliminate "full on" and "full off" operation is to install a *hand controlled by-pass* around the main burner or burners, by-passing the controls and permitting the constant burning of a small amount of gas. This, of course, makes it necessary for the owner to vary the amount of gas burned in the by-pass burner with varying weather conditions. This method works fairly well in severe climates or during the coldest part of the heating season, but it largely offsets the advantage which most owners require of gas heat, namely full automatic operation.

Throttling controls have been used with varying success, the gas input being automatically reduced when conditions are not severe and increased when the demand for heat increases, with a minimum flame or "turn down." However, gas designed furnaces and most conversion burners are designed to operate at maximum efficiency at their rated input. Reducing the input results in decreased efficiency, since no method has been devised to vary the primary air with the fuel input. Poor combustion results with reduced input, the heating surface is out of proportion to the input, and other difficulties occur, such as flash backs, burning in the mixer, and delayed ignition. Therefore, this method is not generally recommended. However, there is a conversion burner on the market which uses what is known as a gradient heat control in conjunction with a room thermostat, as follows:

The burner maintains its high or rated gas input as long as both blades of the thermostat are in contact. As soon as the room temperature rises a fraction of a degree, the first contact breaks and the gradiant heat control reduces the gas input to any desired point.

This low input will then be maintained until the room temperature rises sufficiently to break the second contact in the thermostat, at which time the gas supply will be entirely cut off; or the room temperature drops sufficiently to re-establish the first contact in the thermostat, at which time high input is resumed.

Control By Thermostat

Two Stage Control can be attained by the use of a special circuit and room thermostat with two magnetic gas control valves, which operate in the following manner:

On an initial drop in room temperature, the thermostat closes the first circuit, opening one of the magnetic valves to admit gas to its associated burner. If this action delivers enough heat, the valve is then closed. If the room temperature continues to drop slightly the second circuit is closed, which opens the second magnetic valve to admit gas to its burner. Motorized valves can be used instead of magnetic valves, the motorized valves throttling the input.

Heat Compensated or *Heat Anticipating Thermostats* are recommended to offset the disadvantages of on and off operation and function as follows:

The thermostat has a small electric heater element incorporated into the instrument adjacent to the bi-

metallic blade. This heater compensates for or anticipates a rise in room temperature, thus tending to prevent overheating.

If properly adjusted, when the room temperature is the same as the setting of the thermostat, the bi-metallic blade closes the circuit, a permanent magnet causing the contact to be made with a positive snap action. Current then passes from the transformer to the "red" connection, through the bi-metal blade to the point of contact, back through the "white" wire to the gas control valve, or relay. The gas valve is now open and heat is being put into the system.

As soon as the bi-metallic blade snaps on contact, a parallel circuit (green wire) supplies a current of about 1/100th. of an ampere, from the contact point, through the heater, and back to the transformer. The bi-metallic blade is quickly heated by the combined effect of the heater and room temperature, the contact snaps open, breaking the circuit to the gas control valve *and* to the compensating heater.

The foregoing covers practically all of the inexpensive methods of overcoming or partially eliminating the objectionable features of on and off control.

Meeting Heat Loss Conditions

Continuing with the problem, as long as any heat at all is required to maintain the desired indoor temperature, heat loss occurs, the rate of loss varying with changing outdoor weather conditions of temperature, humidity, wind velocity and sun effect. Practically all heating systems are designed to meet this heat loss on some maximum severe outdoor temperature of 0° F., -5° F. or -10° F., and some infiltration loss due to wind velocity of, say 15 miles per hour.

Consequently, when the outdoor conditions are at the maximum design conditions, for example, -10° F., 15 mile per hour wind velocity, the capacity or output of the heating system exactly meets the heat loss in terms of Btu/ hour, and constant operation results. However, this condition of maximum capacity requirements occurs only during a small part of the heating season.

With an adequate heating plant of sufficient capacity to meet the maximum design conditions, the objectionable features of an on and off burner operation do not occur during the peak demand for heat, when heat is lost at the same rate that it is supplied to the rooms and constant operation of the heating plant is required to off-set the heat loss.

Therefore, if this constant operation could be approached or nearly constant operation attained during the large part of the heating season when some heat is needed although maximum heat loss does not occur, the objectionable features would be eliminated.

Efficiency and economy of fuel consumption, in so far as the furnace and burner are concerned, being predicated on "full on" operation, some method of varying the volume of warm air delivered to the rooms, or the temperature of the supply air, or both, seems to be the most desirable approach to the problem.

A given heat loss can be met by relatively speaking, a small volume of high temperature of "hot" air, or a larger volume of low temperature or "warm air."

Volume of Air Needed

The volume of air to be supplied to a given space depends upon the temperature of the supply air, the heat loss of the space, and the desired room temperature, according to the following formula:

$$\text{Cfm} = \frac{\text{Heat Loss (Btu/hour)}}{1.08\ (t_{s} - t_{r})}$$

where 1.08 is a factor obtained as follows:

.24 = specific heat of standard air.
(.24 Btu required to raise 1 lb. of air 1° F.)

.075 = density of standard air.
(1 cu. ft. of air weighs .075 lbs.)

60 minutes: (Heat loss is in Btu/hour, divide by 60 to get Btu/minute)

$.24 \times .075 \times 60 = 1.08$

For example, assume a house with a heat loss of 90,000 Btu/hour, desired room temperature 70° F., supply air temperature at the register 145° F.

$$\text{Cfm} = \frac{90{,}000}{1.08\ (145\text{-}70)} = 1173$$

Reduce the supply air temperature to 130° F.

$$\text{Cfm} = \frac{90{,}000}{1.08\ (130\text{-}70)} = 1466$$

A lower supply air temperature requires a larger volume of supply air to meet a given heat loss. Lower supply air temperature results in longer fan operation, maintains longer periods of air circulation and tends to prevent stratification. Thus, with a relatively low supply air temperature of approximately 130° F., a longer blower operation is attained by varying the volume of air supplied without varying the supply air temperature.

In addition to controlling the air volume, the temperature of the air can be increased to meet maximum demand.

Such a system of controls has been developed for forced warm air heating systems. The equipment consists of a thermostat sensitive to 1/13° F. temperature change, a motor operated volume control damper with an end switch to energize the gas control valve and change the temperature of the supply air, a day-nite panel if night set back is desired, a combination fan and limit switch, an airstat, and a magnetic gas valve.

The system operates as follows:

1. On the first call for heat, from the thermostat, the damper motor opens the volume control damper in the return air duct slightly, and the switch on the motor energizes the gas control valve through the low set airstat (130° air).

2. As the gas burner heats up the furnace the fan switch in the combination fan and limit control starts the blower and a small volume of low temperature air circulates to the rooms.

3. As the heat loss increases, the motor opens the damper further to permit more air to circulate.

4. When the damper is 75% open, the switch on the damper motor shorts out the low set airstat, placing the burner under control of the high-set limit in the combination control to deliver higher temperature air. Recommended settings:

Airstat - "On" 110°, "off" 130°
Limit - "On" 160°, "off" 180°
Fan switch - "On" 100°, "off" 80°

5. Soon the motor reduces the damper opening to

keep heat input balanced with heat loss. Thus the system can meet further increase in heat loss by again increasing air volume.

6. When decreased heat demand permits reducing the damper opening to 25%, the switch on the damper motor returns control to the low set airstat. The motor may then open the dampers slightly to compensate for the lowered air temperature.

7. When further decrease in heat loss permits closing the dampers almost entirely, the switch on the damper motor shuts down the burner, but the fan runs until the furnace cools to the "fan off" setting of the combination control.

Importance of Air Distribution

It is well to bear in mind that some of the complaints of drafts and un-even heat distribution commonly blamed on controls or "on" and "off" operation may be partially due to an improperly designed air distribution system.

The application of gas designed equipment or conversion burners to existing coal fired systems requires especial care if owner satisfaction is to be attained. People have come to expect near perfection from automatic gas heat, and while they may not have complained of the poor heating results of their present heating system, if a gas furnace or conversion burner is installed without necessary alterations, corrections or additions to an inadequate system, the deficiencies of the system will be accentuated by the on and off operation of the gas fired equipment.

Therefore, the following procedure is essential when the installation of a gas designed furnace or conversion burner is contemplated in an existing heating system.

A. Make a careful survey and heat loss calculation to determine the heating capacity required and adequacy of the present heating system.

B. If the present heating system is 30% or more short of the required warm air leader pipe area or return area, the gas fired equipment should not be installed without making the necessary corrections and additions to bring the system up to standard. Automatic gas heat will not overcome the deficiencies of an inadequate heating system.

The location of supply and return air registers and grilles must be given careful consideration if drafts are to be avoided and proper warm air distribution attained. There seems to be two schools of thought regarding the location of warm air registers. Some heating engineers hold to the theory that the warm air should be discharged along the outside or exposed wall surfaces, thus blanketing these cold surfaces with warm air, and that the "cold air" or return grilles be located at the inside walls or partitions. Our personal experience indicates that better results are obtained by locating the warm air registers at the inside walls or partitions, discharging the warm air toward the exposed walls. Location of the returns near the exposed walls or under windows then catches the cold air as it moves down to the floor level and conducts it to the furnace to be reheated. If the returns are located at the inside partitions, this cold air is pulled across the floor, and an uncomfortable feeling of air motion and "draft" results.

Dampers should be installed in all warm air leader pipes, and in both supply and return lines of forced warm air systems to permit adjustment of the flow of heat to the various rooms.

Time does not permit detailed discussion of recommended practices and layout procedures in designing gravity and forced warm air heating systems. However, with respect to forced warm air systems, whether you use the velocity reduction method, equal friction method or static regain method of sizing duct work, the systems for residences should be a low velocity system. The velocities recommended are approximately 650 ft. per minute at the unit or fan discharge, 500 ft. per minute in the main trunk, 400 ft. per minute in the branches and risers and around 250 ft. per minute face velocity for registers located in the baseboard. Much higher velocities tend to create an undesirable consciousness of air motion, drafts and air noises in the ducts.

Conversion Burners

If the use of the present furnace and a conversion burner is contemplated, the furnace should be carefully cleaned and examined for possible leaks in the combustion chamber before installation of the burner. The furnace rating should be ample to heat the premises.

The conversion burner selected should be of a type suited to fire that particular furnace and have the proper input rating to fire the furnace at its rated capacity. You cannot "over gas" a conversion burner or a gas designed furnace in an effort to get more heat from an undersized furnace and so overcome the deficiencies of furnace capacity or of the distribution system. An attempt to "force" gas fired equipment results in incomplete combustion, clogging of the furnace with carbon deposits and the probable formation of carbon monoxide.

The continued cooperation of dealers, contractors, utilities and the American Gas Association is essential in order that we may all work together toward the end that owner satisfaction with automatic gas fired heating equipment will reflect credit on all of us engaged in the heating, ventilating and air conditioning industry.

August Construction

CONSTRUCTION was started during August on 25,166 new dwelling units financed and built under the program of the Federal Housing Administration. This is a greater number than in any postwar month, and second largest in the history of FHA. The record volume was 26,100 units started in July 1941.

The August total was more than four times the 5,777 units started in the same month last year under the FHA program, and nearly three times the 1946 peak of 8,696 started last October.

This is the eighth successive month of increases in starts of residential construction under FHA-insured financing.

Bacteria Removal By Air Filters

By A. W. Brown

Research Products Corp.
Madison, Wisconsin

The benefits to be derived from use of filters in a winter air conditioning system are often accepted as a matter of course. However, here is an article that shows by research that a very definite sales story can be based on the assistance to good health rendered by efficient filters in a forced air system.

ALTHOUGH the fact is frequently overlooked, modern air conditioning systems perform an important service in ridding indoor air of a large part of its bacteria content. Since many bacteria are the causes of disease and because they are easily carried by the air from one person to another, this function of air conditioning systems is important from the standpoint of health.

Many elaborate methods have been designed and are used to eliminate microorganisms from indoor air. Not always recognized is the fact that by the simple, inexpensive means of well designed, efficient, disposable air filters much bacterial contamination may be eliminated. Most air conditioning and forced air heating systems include such filter equipment.

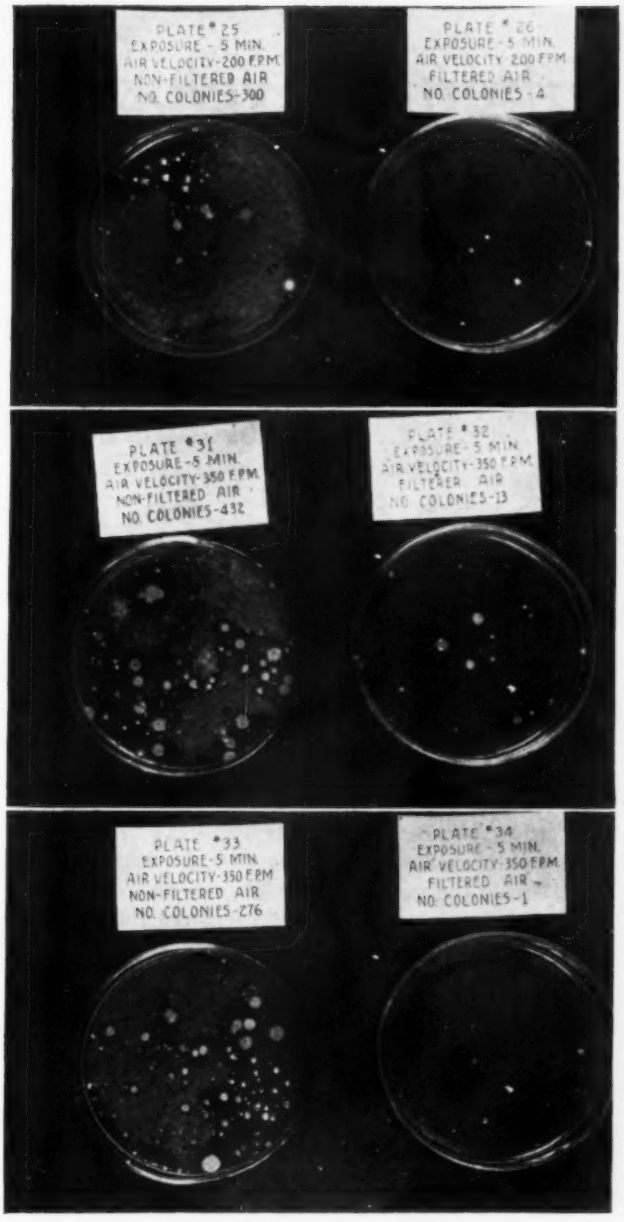
Nature of Bacteria

Bacteria are single cells of living matter about 1/25,000 of an inch in diameter and it may sound unreasonable that an air filter can hold and trap particles of such microscopic size. The answer lies in the fact that bacteria, lacking power of locomotion, attach themselves to tiny particles of dust and other impurities suspended and transported by the air. Many of these particles, large by comparison with bacteria, are trapped and held along with their bacteria passengers by efficient filters.

Proof of the effectiveness of filters in this respect has been graphically demonstrated by a series of tests made in the laboratories of the Research Products Corporation in Madison, Wisconsin. The work done by engineers of this firm, assisted by a well known bacteriologist, indicated that efficient filters remove 90-97% of the bacterial content of air handled by a blower-filter system.

Briefly, the test apparatus consisted of a conventional type of blower equipped with filters and sufficient ducts to provide facilities for installation of sampling and dust metering devices.

In order to obtain a uniform typical test dust, the contents of a vacuum cleaner from an average well-kept home were used. This dust was screened to obtain a fixed formula of particle size. The screens varied



from a fine of 325 mesh to meshes of 300 and 250. The resultant dust assured uniformity of conditions for each test performed.

This mixture was metered into the air stream at the rate of ½ gram for each 5 minutes of blower operation.

Six inches ahead of the filter and six inches downstream from the filter laboratory vessels known as Petrie dishes were placed. These contained a nutrient mixture on which bacteria can thrive and develop. For further accuracy and uniformity in making tests, a sampling device permitted only one cubic foot of the dust and air mixture to pass over each Petrie dish during the 5-minute period of blower operation.

Incubation Period for Development

Immediately after each test period, the vessels containing the nutrient were placed in incubators held at 68° F temperature. They remained there for nine days

(Please Turn to Page 142)

Pattern Development for

Air Conditioning Fittings*

By William Neubecker

Duct Intersection—Square to Round

THE following solution with the accompanying illustration Fig. 67, shows the method of developing the pattern for a tapering square to rectangular branch, intersecting a vertical round duct, tangent at 1 and 1° in plan. Using *A* in plan as a center draw the desired diameter of the round duct. Through *A* draw the horizontal line *A-B* and the perpendicular line *1°-E*. At pleasure establish the projection of the tapering branch as shown from *4* to *B* in plan. Make *C-D* equal to the width of the square duct and draw the section of the square outlet on the line *C-D*, as shown at the right. Divide the quarter circle in plan as shown from *1* to *4*, from which points erect perpendicular lines to intersect the horizontal or the bottom line of the tapering branch *F-4* in elevation as shown. Establish the taper of the square outlet in elevation indicated by *L-I* and draw a line from *I* to *4'*. Make *I-H* equal to *C-D* in plan. Bisect *H-I* and obtain *Y* through which draw the center line *Y-X*. As the taper of both bottom and top of the branch in elevation are similar, only the lower half is necessary. If desired the complete elevation can be drawn as shown by *E-F-4'-1-H-4°*.

Opening Cut in Round Duct

The opening to be cut in round duct will be a rectangular, whose length will be equal to the girth of the semi-circle *1-1°* in plan and whose width will be equal to *E-F* in elevation.

Pattern for Tapering Branch

The tapering branch will be developed by triangulation as follows: From points *1* to *4* in the quarter circle in plan, draw lines to the corner *C* as shown. From similar points on the joint line *F-4'* in elevation draw lines to the corner *I*. These lines just drawn in elevation, are not necessary in the development of the pattern shape, but show that they all have a similar rise as indicated by *L-I*. *a-C* shows the rise of the taper in plan. The lines drawn from *1-2-3* and *4* in plan to *C* indicate the base lengths of triangles to be constructed whose vertical heights will be equal to *L-I* in elevation and are found as follows: Extend the line *F-L* in elevation as *F-1*. From any point as *C°* erect the perpendicular line *C°-b* equal to *L-I*. Now take the various lengths in plan *C-1, C-2, 3* and *4* and set them off from *C°* in the diagram of true lengths as indicated by *C°-1, C°-2, 3* and *4* and from points so obtained draw lines to *b* which will be the true lengths of similar numbered lines in plan. The half pattern will now be laid out with a seam along *X-Y* in elevation. Take the distance of *C-D* in plan and set it off as shown by *C°-D°* in the half pattern shape. Now using *b-4* in the true lengths as radius and with *C°* and *D°* in the pattern as centers describe arcs intersecting each other at *4*. Draw lines from *4* to *C°* and *D°*. With radii equal to *b-3, b-2* and *b-1* in the true lengths and using *C°* and *D°* in the pattern as centers draw short arcs near *3-2* and *1*. Set the dividers equal to the divisions shown in the semi-circle in plan and starting at *4* in the pattern shape step to arcs *3-2* and *1* and draw lines from *1* to *C°* and *1* to *D°*. Trace the curve through the inter-sections *1* to *4* to *1*. As the seam is to come along the line *X-Y* in elevation, it becomes necessary to divide the irregular figure *X-Y-H-E* into two triangles so that the devolpment of this surface can be made. Therefore draw the dotted line the shortest way across as from *H* to *X*. As this surface has a taper equal to *a-C* in plan the true length of this line *X-Y* in elevation is found by taking the depth of the taper *a-C* in plan and setting it off at right angles to *X-H* in elevation as shown from *X* to *A'*. A line drawn from *a'* to *H* will be the desired true length. To complete the half pattern, take the distance from *E* to *X* or *F* to *X* in elevation as radius, and with points *1* in the pattern as centers draw short arcs near *X°* and intersect them by arcs struck from points *C°* and *D°* as centers with a radius equal to the true length *a'-H* in elevation. Now with *I-Y* or *H-Y* in elevation as radius, and using *C°* and *D°* in the pattern as centers, draw short arcs near *Y°* and intersect them by arcs struck from *X°* as centers with a radius equal to *C-1* or *D-1°* in plan. Connect these intersections in pattern by drawing lines from *1* to *X°* to*Y°* to *C°* and to *D°*. Then will *X°-1-4-1-X°-Y°-D°-C°-Y°* be the net half pattern shape. Edges must be allowed for seaming or riveting. The heavy dots in the half pattern indicate where very slight bends are to be made, showing the juncture between the conical corners and flat surfaces of the transition.

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PATTERN FOR TAPERING SQUARE DUCT INTERSECTING VERTICAL ROUND DUCT

— SOLVED BY TRIANGULATION —

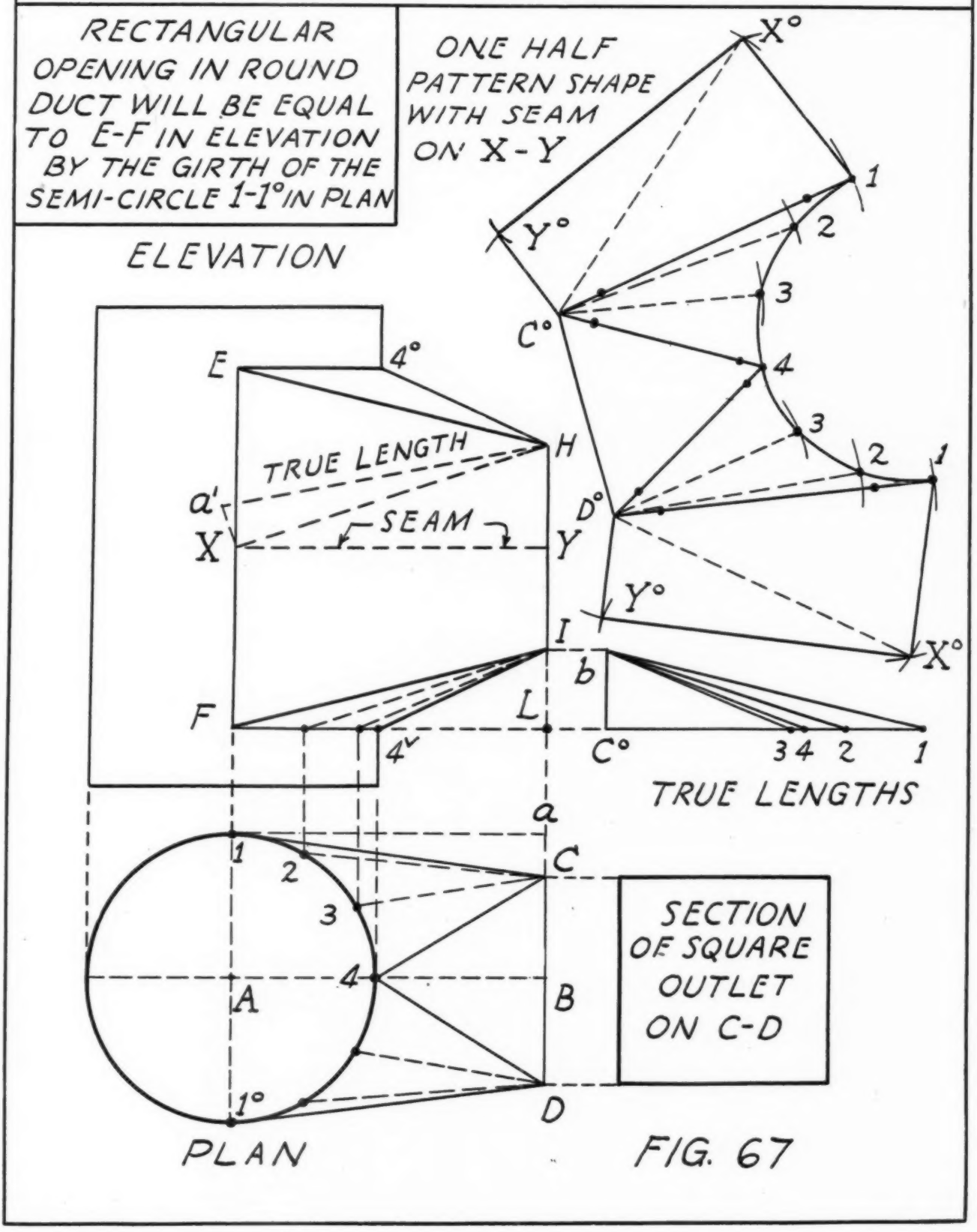


FIG. 67

OPEN for DISCUSSION

Gravity System With Air Filters

Readers are invited to Comment

FROM E. Williams of New Toronto, Canada comes the sketch shown below and a letter in which he says—"The small home owner is confused when he comes to buy a warm air furnace; he has heard so much of the new wonders in heating he is completely undecided as to what he should buy. The fact still remains that a gravity furnace—properly installed—affords excellent service at low cost. The new ideas seem to cost more than the owner wishes to pay, but he does want dust free air, positive heat, fire control, humidity, and as much room as possible in his basement. The system I show and describe gives all these.

"The gravity warm air heating system shown has been used with success for some time. The results have been so encouraging that I am sure it is the answer the small home owner has been looking for.

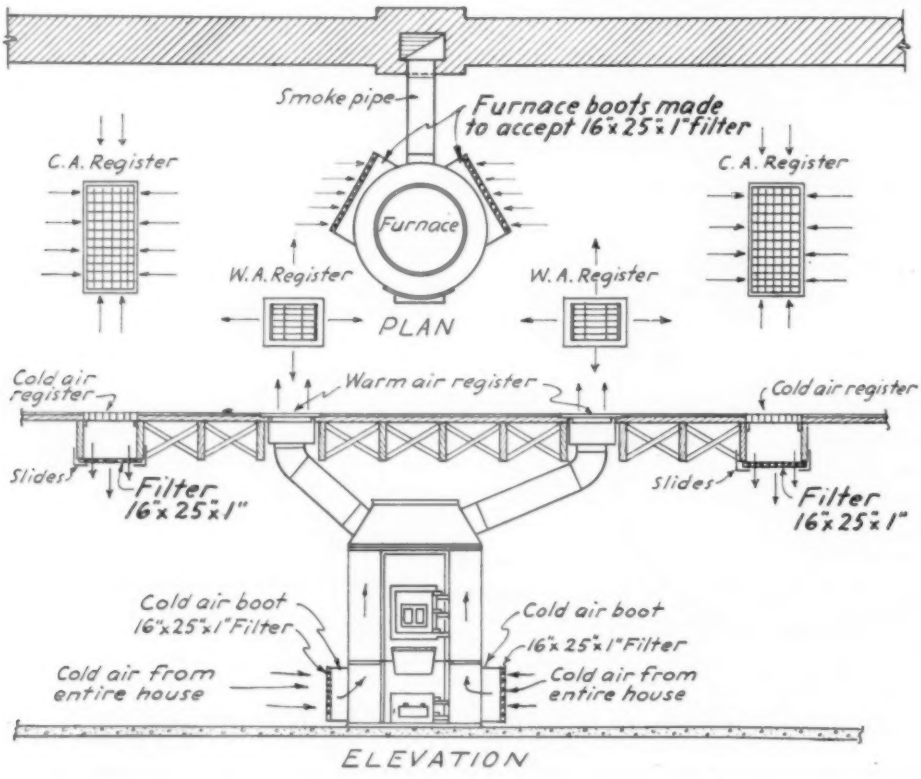
"The main features are — cleanliness (no dust); ready access to the inside of the furnace casing and cold air grilles, which ordinarily after years of service become loaded with dirt; the simple method in which cold air is taken off the floors, permitting warm air to immediately take its place; the head room and floor space made available when no cold air ducts and pipes are used.

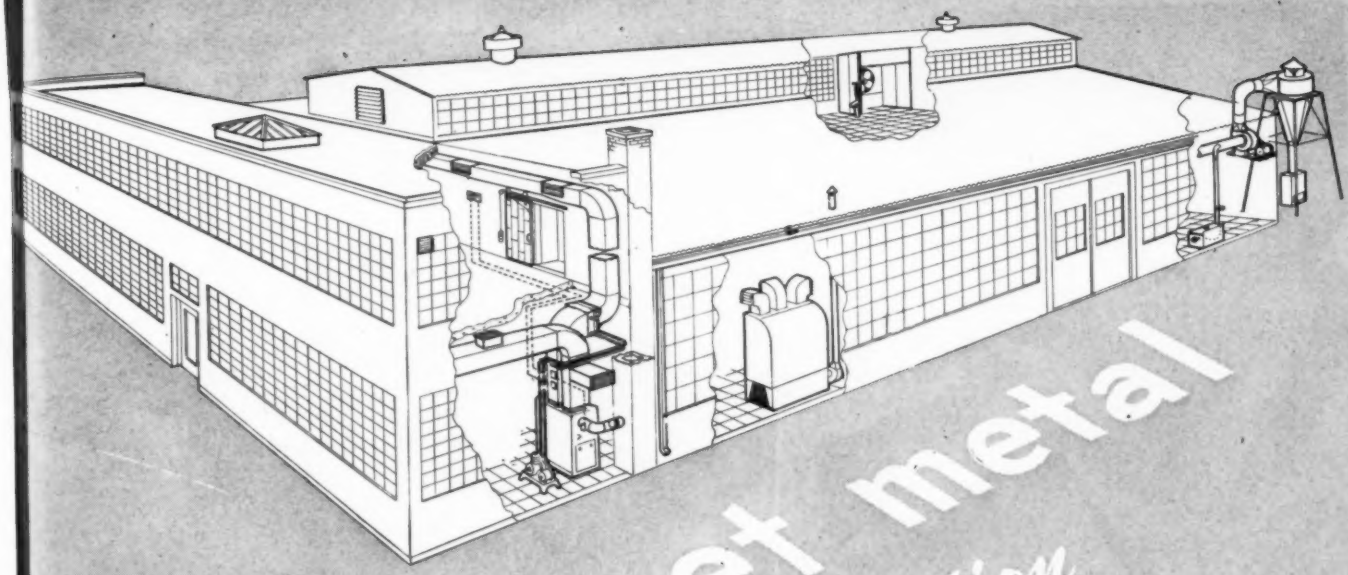
"The extra heat made available when the furnace has only the resistance of the warm air pipes to overcome is also a feature.

"Longer life of castings from always having an abundance of cold air plus no worry about motors and fans; the filters in the casing tend to spread the air flow through the casing and prevent short circuiting.

"The constant change of air through the basement to the furnace keeps the basement fresh and dry permitting the use of a recreation room or work shop; the filters in the returns prevent coal and ash dust from entering the house.

"The normal temperature of the basement is around 65° fahrenheit and the furnace performance I find is improved about 25%."





sheet metal *Section*

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Save Time and Money With Compressed Air

The subject of compressed air has been handled recently on these pages from a standpoint of increased efficiency thru application of pneumatic tools. Here is an article that describes actual experiences of a sheet metal shop that became interested in such tools thru economies to be gained.

SUPERIOR HEATING & VENTILATING COMPANY of San Diego, California (below), owned and operated by T. O. Sandell, is engaged in subcontracting on building construction and the manufacture of such products as aluminum awnings, sheet metal boxes and parts of various kinds. In cost accounting, to keep production expense low, saving man-hours is essential and man-hours have been saved in several ways since the company installed an air compressor and distributing system. At the $2-an-hour minimum wage paid in the shop, those hours saved added up to a substantial sum day by day.

An automatic spot welder, shown in Fig. 1, offers one example of compressed air at work in the San Pedro shop. At first touch of the foot pedal, the operator releases compressed air which clamps the electrodes to the work. A continued push turns on the current for welding. This arrangement is almost essential in spot welding if the operator is to have exact control of the pressure applied and also wants to gain the full benefits of the speed possible with spot welding in joining sheet metal sections. Since compressed air can be exactly controlled and regulated to varying conditions and is fast in action its use has greatly increased output and quality of work done on this spot welding machine.

Hand brushing of paint on flat surfaces is obviously far slower than spray painting and when it comes to a job such as the painting of an expanded metal door, such as shown in Fig. 2, the cost of hand brushing is almost prohibitive.

The average sheet metal shop has a considerable amount of painting work to do and most of it can be done better and faster by spray painting. Superior Heating & Ventilating calculates that the cost of an air compressor installation has been returned on the savings from this one application of compressed air alone.

Bending by Air Pressure

An especially-designed brake for bending aluminum slats has been devised by the company in order to reduce the time required for hand operation of a brake on this work. This machine, shown in Fig. 3, has a lip over a square block. A metal slat is placed in the machine and the die lies flat on the metal until a plunger powered by an air cylinder rolls it over to shape the angle. The operator cannot make a mistake

Data and photos for this article were obtained by the Compressed Air and Gas Institute through the courtesy of Superior Heating & Ventilating Company, San Diego, California.

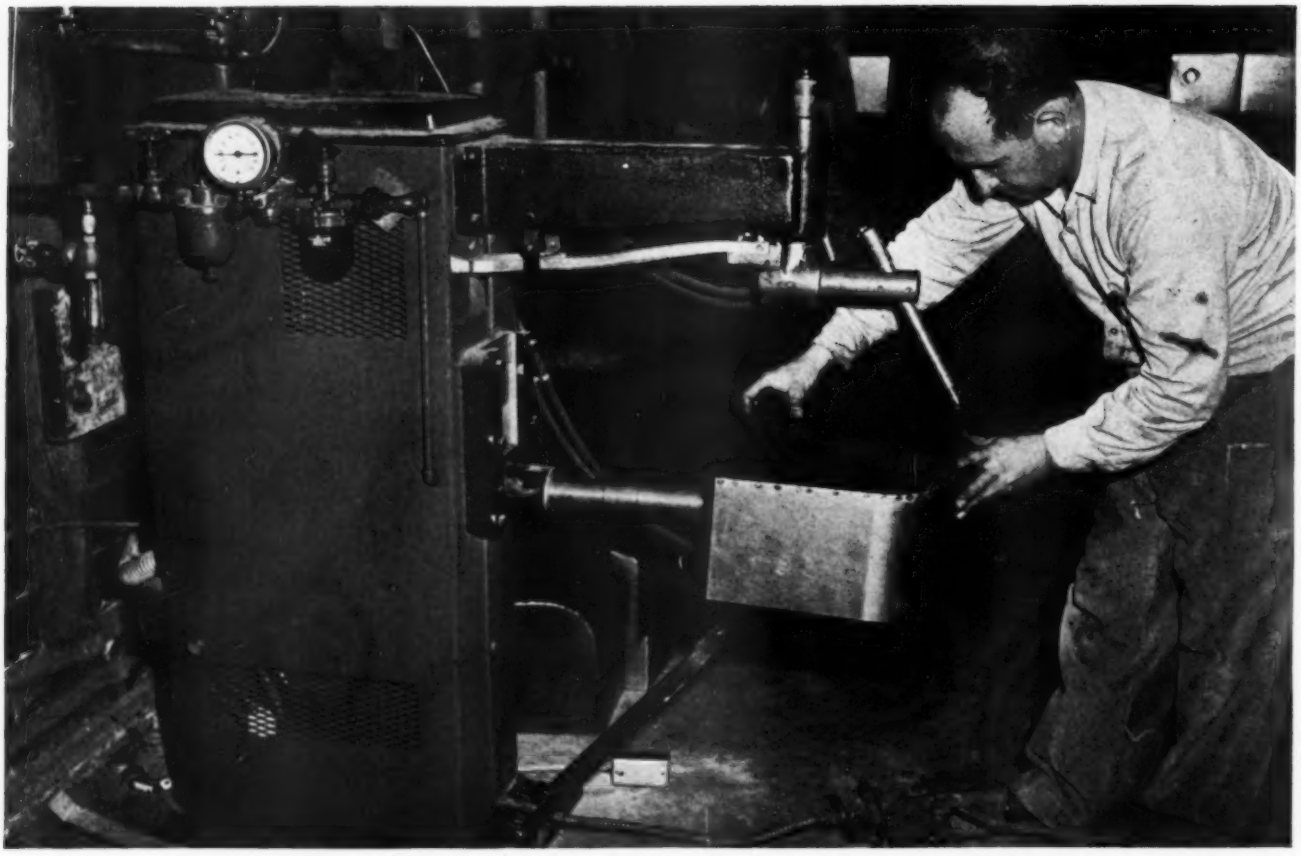


Fig. 1—Compressed air clamps the electrodes of this spot welder to the work in order to get uniform pressure and faster action than would be possible with other methods of clamping. The work shown is on a delivery truck body part.

Fig. 2—Hand brushing of paint on this expanded metal door would require about the same number of hours as the number of minutes in which it is done by painting with an air-spray gun.

on this work because a gage holds the part exactly in place in the shaper. Compressed air supplies the even, steady pressure for the shaping at the touch of a valve by the operator. A conservative estimate on the time saved by this machine was placed at three to one over manual operation.

Compressed air for the described work is supplied by the two-stage air compressor shown in Fig. 4. This unit is driven by a 3-horsepower motor and produces air at 175 pounds per square inch pressure. This high pressure is ample for any job in the shop and at those jobs requiring a lesser pressure, regulators reduce to the desired pressure. At present the compressor is located at one end of the shop, but on completion of an expansion program in progress, it will be centrally located. Proximity to the work is desirable in order to hold down pressure drop along the lines.

This company installed its air compressor over a year ago. Other sheet metal shops contemplating the installation of a compressed air system might be interested in the plans of the San Diego company in connection with making their own estimates for desired capacity.

Use of Pneumatic Tools

Experience with compressed air on present uses together with a study of work in other metal working plants has caused conversion to portable pneumatic tools for grinding, buffing, hammers and drills. Re-

placement of a heavy grinder by a pneumatic grinder should enable a worker with the new portable tool to turn out 25 per cent more work in an 8-hour day than at present. Reason for this increase is that pneumatic tools weigh much less than other portable tools of similar power and go far toward eliminating worker fatigue.

Throttle control of speeds for pneumatic tools is in the worker's hand, enabling him to do better as well as faster work. In drilling, for example, the worker can start at a low speed while finding the center, then step up speed. The variable speed control also has advantages in buffing and grinding.

Seam Closing by Air Hammer

One of the important uses for air hammers contemplated as soon as the equipment can be delivered is in closing of Pittsburgh locks. Mr. Sandell estimated that his shop will be able to do this work four or five times faster than by hand hammering because of the fast, regular strokes of pneumatic hammers. Absence of hammer marks when an air hammer is used also assures better appearance.

Plans are being made by the company to convert one or two of its brakes to compressed air operation as well as hand-operated punches and a shear and punch. In each case, the reason for the change is virtually the same: the operator can accomplish more

(Please turn to page 140)

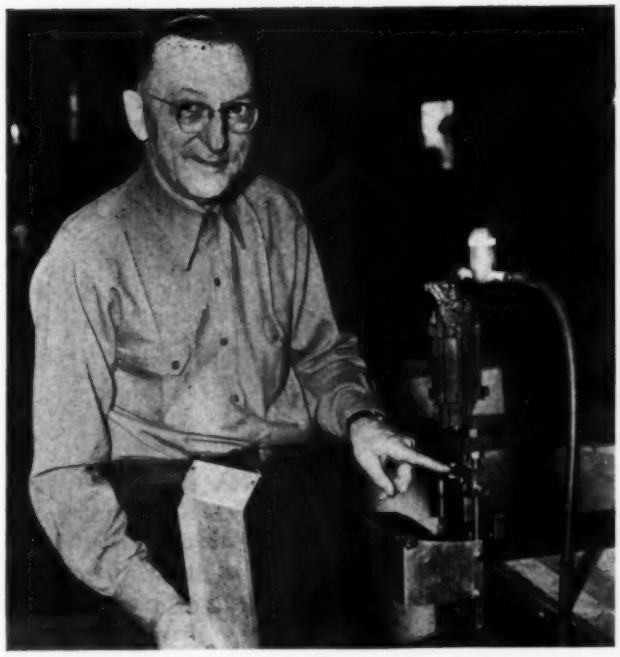
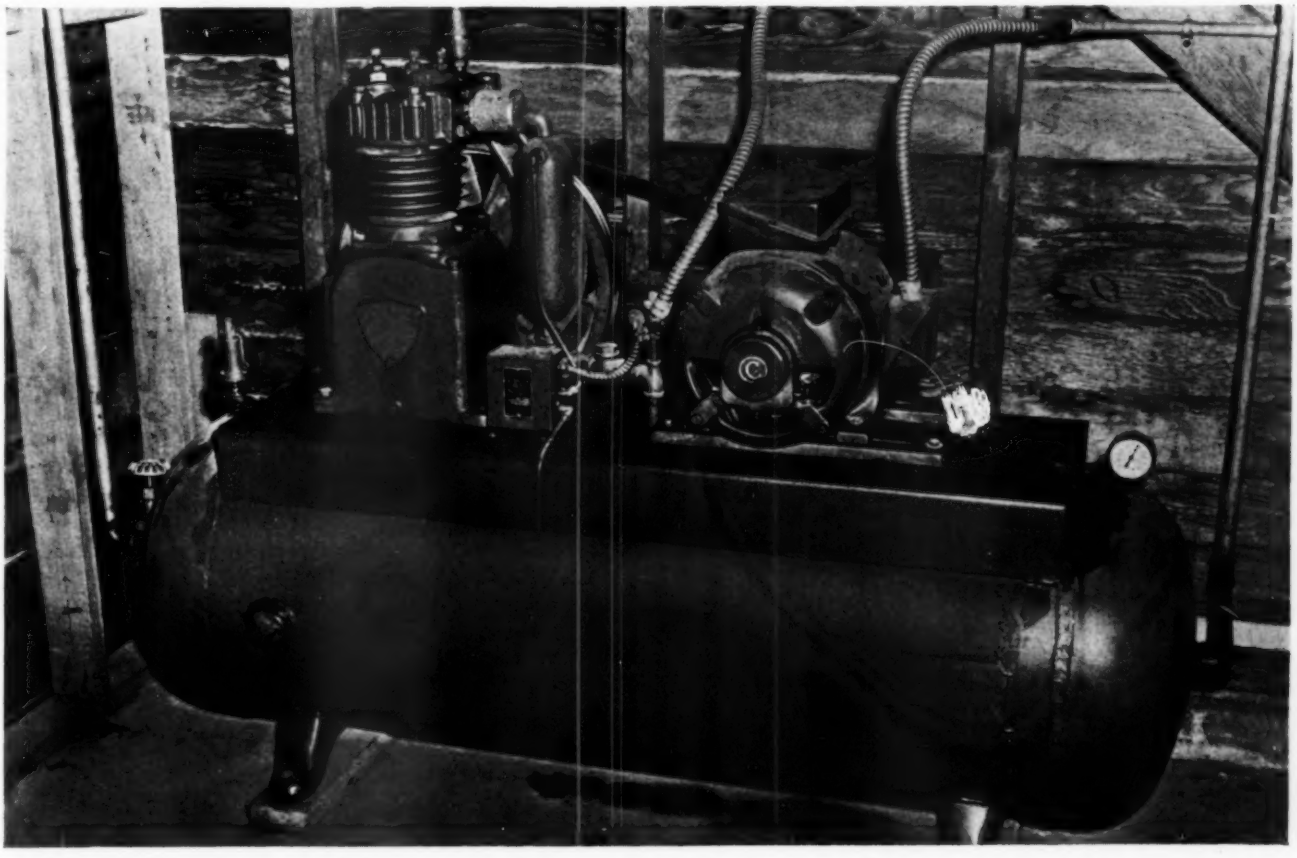


Fig. 3—T. O. Sandell, owner of the Superior Heating & Ventilating shop, explains the air-operated brake which was designed especially for shaping aluminum slats. The box-like gage automatically positions the metal to be shaped, then a touch of the lever and compressed air is released to roll the slat over the die.

Fig. 4—This two-stage air compressor supplies the shop's compressed air requirements. It is driven by a 3-horsepower motor.



Design of Waste Removal Systems (Part II)

By H. M. Nichols
Industrial Dep't, Sturtevant Div.,
Westinghouse Electric Corp., Hyde Park, Mass.

These articles are adapted from a series of lectures that are presented in the Sales Engineering School of B. F. Sturtevant Co. Their application of basic principles is so sound as to be of value to any sheet metal contractor handling this type of work in any good volume.

AS SOON as air starts to flow in a system a resistance to the air flow is set up which must be overcome by the fan pressure in order for the air flow to continue. This is somewhat analogous to the conditions in an electrical circuit where a drop in voltage is set up by the resistance of the conductor through which the current flows.

We call this resistance to flow "Maintained Resistance," which is equivalent to the static pressure that must be produced by the fan in order to continue the stated air flow.

The maintained resistance consists of a number of factors, the more important ones being frictional losses, losses caused by changes in velocity, work to get the air into the system and bring it up to the system velocity, losses due to conditions causing turbulence in the air stream, resistance of collectors and filters.

To compute the maintained resistance of an exhaust system, first determine the point of greatest resistance either by inspection or trial.

Starting at the point of maximum resistance, compute the various resistance elements and add them together to obtain the maintained resistance of the system.

Expressed algebraically, $R = W + P + C + E + N$.

R = Maintained resistance = fan static
W = Work required to get the air into the system and up to system velocity
C = Collector resistance
P = Pipe frictions
E = Pressure drop due to changes in velocity
N = Other pressure drops, if any

"W" or the work required to get the air into the system will vary with the type of hood or opening into the duct and the material introduced with the air. Since it is impracticable to determine this factor for the average exhaust system, we assume W to be one-half the suction at the throat of the hood (usually measured about 6 inches from the throat), or in the case of a velocity rating at hood throat, we assume W as equivalent to the velocity head corresponding to the average velocity (velocity in suction pipe). Field experience and tests have shown that this method of determining work at hood entrance is close to average conditions. If more exact knowledge is available as to entrance conditions, the determination of pressure drop or work at entrance may be modified accordingly. Experience has shown that entrance coefficient of these systems will average close to 70 per cent, which is consistent with the method of determining work at hood entrance.

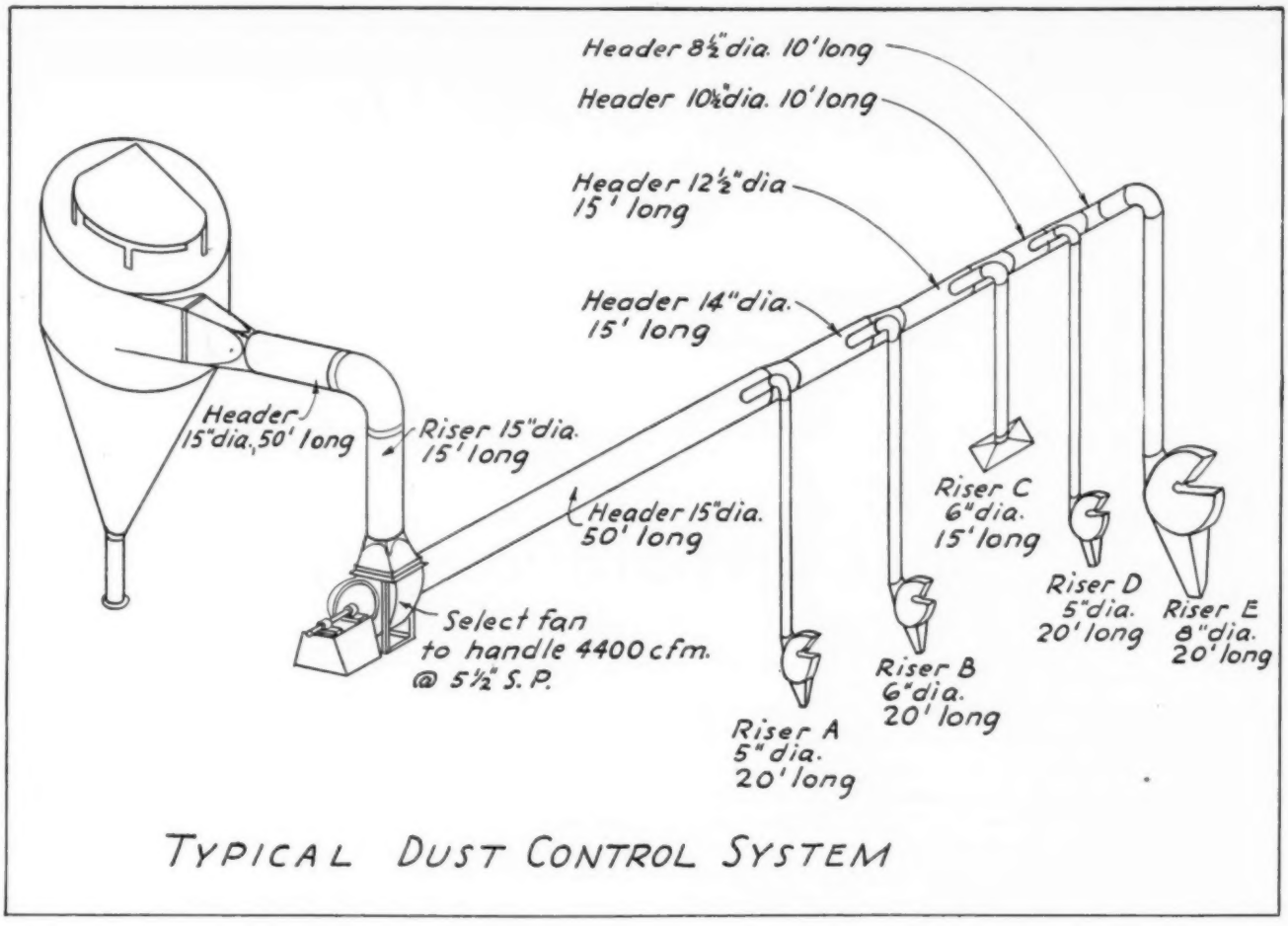
Pressure Drop Due to Friction in Pipe

When air flows through a pipe or duct there is a pressure drop caused by the friction between the air and the surface of the pipe and also there is some loss caused by the reaction of the particles of air on each other as they flow through the pipe to its far end.

Usually the point of maximum resistance will be at the end of the branch farthest from the fan, although it may be at a small diameter or long branch near the fan. If the point of maximum resistance is not readily apparent by inspection, it should be determined by trial. In addition there is the frictional effect of material carried in the air streams. However, this loss is of small magnitude and we bring all of these factors together under the general term Pipe Friction "P."

In figuring the pipe friction "P" start at the point of maximum resistance and add together the frictional components comprising the continuous duct.

Experience has indicated that figuring friction resistance on the basis of one velocity head drop in 50 diameters of length of pipe will cover the normal friction drop with allowance for the effect of unevenness in commercial pipe and the flow of material in the air stream.


Header 8½" dia. 10' long
Header 10½" dia. 10' long
Header 12½" dia 15' long
Header 14" dia. 15' long
Header 15" dia. 50' long
Riser 15" dia. 15' long
Header 15" dia. 50' long
Select fan to handle 4400 cfm. @ 5½" S.P.
Riser A 5" dia. 20' long
Riser B 6" dia. 20' long
Riser C 6" dia. 15' long
Riser D 5" dia. 20' long
Riser E 8" dia. 20' long

TYPICAL DUST CONTROL SYSTEM

Expressed algebraically, the pressure drop in straight round galvanized iron pipe when handling air at standard density is determined by the following formula:

$$P = \frac{L}{50} \times \frac{12}{d} \times i$$

P = Drop in inches of water
L = Length of pipe in feet
d = diameter of pipe in inches
i = Velocity head

$$i = \left(\frac{V}{4000} \right)^2$$

V = Velocity in feet per minute

For rectangular ducts the pressure drop is increased by the ratio of the perimeter of the rectangular duct to the perimeter of a round duct of equal area.

Friction in metallic and rubber hose is considerably greater than for straight pipe. The internal contour of the hose has a marked effect on the friction. Well-made hose can be figured at one and one-half times the friction of equivalent pipe.

Pressure drop in elbows is most easily allowed for by adding to the straight pipe before figuring the friction in same, an additional length of cover loss in the elbows.

For each elbow having a center line radius equal to twice the pipe diameter add 8 diameters of length, for center line radius equal to pipe diameter add 12 diameters of length, and for mitre elbows add 50 diameters of length.

In order to obtain balanced suction at all hoods the pressure drop produced by the air flowing in any branch line should equal that obtained in that part of the main duct and branches which lies upstream to the branch under consideration. This balanced condition can be obtained by the use of adjustable restrictions at the downstream hoods, or by an increase in the velocity and consequent friction drop in these downstream branches. In the case of unbalanced systems which are reasonably compact and symmetrical, the effect of unbalance on pressure drop may be neglected and the friction in the main figured on a uniform basis just as though there was no additional increase in air volume and consequent friction downstream part of the main due to the extra unbalanced suction at the downstream connections, since there is sufficient margin in the friction formula used to take care of this extra drop in the usual systems.

Collector Resistance

Cyclone collector resistance is determined by the formula:

$$R = C \frac{V^2}{(1000)^2}$$

R = Resistance in inches of water
V = Velocity in feet per minute at collector entrance

(Please turn to page 132)

Tools and Their Uses

A series dealing with the various tools that are used in and adapted to sheet metal work. The articles will discuss common uses as well as unusual applications that may not be familiar.

By Ernest E. Zideck
Sheet Metal Consulting Engineer

Blank Preparation (III)

IN the preceding articles in this series dealing with Tools and their Uses in *sheet metal working*, we have shown and explained the "outer edge" shearing, which can be done by the handshear, the squaring shear, the circular or curved edge shear, the band saw or any other tool or machine that would do *blanking* in sheet metal exteriorly or, along the outer edge of the sheet. This outer edge blanking we have classed as the number one operation in all sheet metal working, since it is distinctly the most important in any and all fabrication or working in sheet metal. Correct outer-edge shearing or blanking makes for correct fit of the parts or the right dimension of the unit on which we work. Again, inasmuch as other operations subsequent to blanking must be commonly gaged from the outer edge of the produced blank, it is evident why we stress the importance of having this edge in all particulars corresponding to the pattern or layout or engineering calculations.

Gaging From Outside Edge

We have said that by the use of a simple sheet metal gage for the squaring shear we can do the corner clipping (a) in Figures 1 and 3, below, in this shear. But although the handshear can be used in all notching and outer-edge cutouts shown in the several Fig-

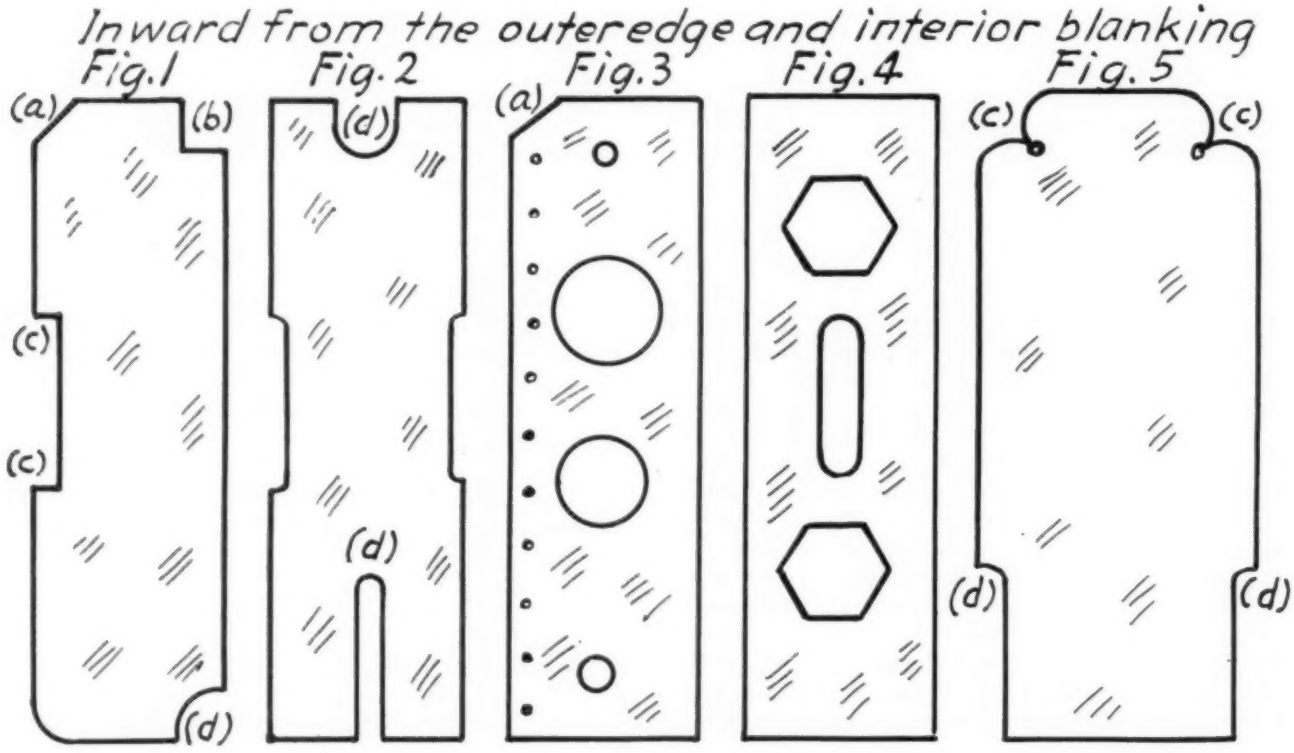
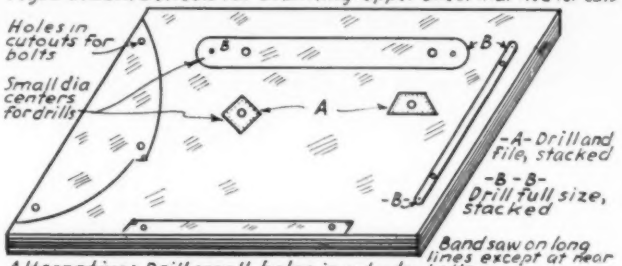


Fig. 6 Stacked sheets for blanking: Upper sheet marked for cuts



Alternative: Drill small holes in cutouts, bolts, marking long lines and take apart, finishing by shears.

ures, not so the squaring shears. The use of this shear is limited to "straight" cutting, and whenever we have blanking problems in which the cut extends into the sheet, be it yet from the outer edge, we cannot use the squaring shear for such cutting. We can use a nibbler, a rotary disk shear, slotting shear or the band saw in this cutting however. We can do the work by dies operating in a punch press. It all depends on *how many* identical blanks we want to produce. If it is only one blank of the specific nature, the quickest way would be to do the blanking, additional to shearing the metal on straight lines in the squaring shears, by handshears. That same, having one piece only to make, applies to the interior blanking shown in Figures 3, and 4. Irrespective of the number of modern machines we may have in the shop, wherever only one blank of a certain nature is to be made, the handshears, the drill, the chisel and the file will serve to accomplish the work in half the time it would take to set the machine or find and insert the dies to do it with.

Tool Set-Up Needs Quantity Production

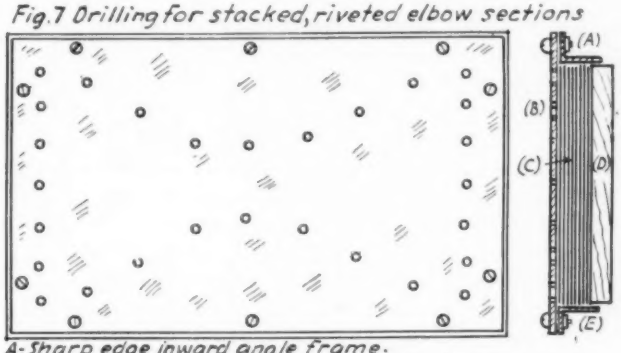
The *use of tools*, even if we have them in the shop, is determined by whether we want one or ten pieces of the same pattern, or hundreds. One single blank, no matter how complicated, can be made to advantage by hand tools. If it is only ten pieces we want, provided the metal is not of a too thick gauge, we can clamp or rivet or tack-weld the ten sheets together and do the interior blanking as of Figures 3 and 4, or any other pattern of the holes or slots, by drilling through the ten thicknesses of metal. The round holes in Fig. 3, or any amount of holes not exceeding the drill capacity, and unless we have a die doing the holing at one stroke of the press, can be produced in the *stacked* metal quicker than by die-setting for the multiple diameters of holes and the required gage-setting for the press. Just so, if we deal in hundreds of identical blanks, it will pay us to have dies for even such common notchouts as (b) in Fig. 1. Nibbler, slotter and rotary disk blanking is *individual*; each sheet must be handled separately. On the other hand we can stack the metal in any suitable or handy manner aforesaid, drill small holes in the corners or radial slot terminus, as of (c) and (d) in the Figures, and then complete the blanking job in the band saw.

Interior blanking such as indicated in Fig. 4, and if we have no special die-sets for the holes, slots or openings, may be accomplished productively by stacking the sheets as above said and as illustrated more clearly in Fig. 6 of the accompanying drawings. This modus of interior blanking (referred to also as "provisioning"), will prove practical and economical whenever we have more than one similar blank to produce, and, obviously, if we have but one piece to make, which we do not need to stack. In quantity production, again considering that we have no dies for the openings or their procurement is not warranted by the few hundreds of blanks of that nature (there being no repeat orders), it will prove best to make a drill jig, on the order of the one shown in Fig. 7, through which to drill the small or larger holes in the stacked sheets. The sheets should not be stacked to more than three eighths of an inch thickness of the combined metal layers. In fact, if we must use a very small diameter drill in the work it will be best to confine ourselves to only three sixteenths of an inch of the multiple (stacked together) metal. A drill jig as shown in Fig. 7 need not be bushed for the small holes; but if the holes exceed three sixteenths of an inch diameter, and if we want to use the jig for more than one hundred pieces of the blanks, steel bushings will be wanted. Also, in such a case, we can use a steel plate and heat the metal to cherry red around the holes, eventually cyaniding the edges of the metal around the holes. We can also use a Kirksite plate in this connection, this metal needing no artificial hardening. If we make such a plate drill jig we evidently will spend a little time on it, laying the holes out right and spacing them close enough to admit of the slugs falling out, the openings calling for a minimum of filing work. If we have grinding wheels or tips fitting the openings, the stacked metal will endure the smoothening process that much better. If we have a band saw handy, with a blade narrow enough for the work, its use for the smoothening job might be productive of good results, especially so if we provide another plate jig, shown in Fig. 8-A, through which to govern the action of the blade.

Factors In Production

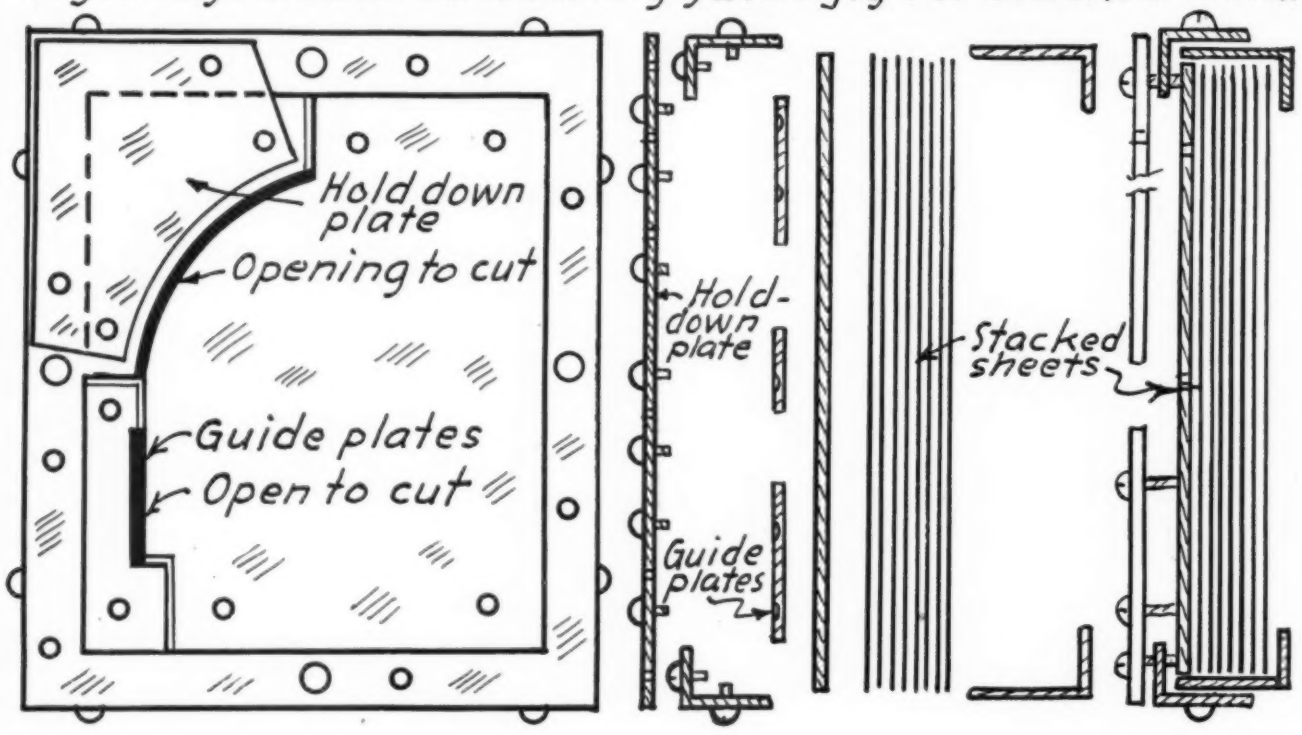
In any given production problem three factors figure: one, the quantity of the items or units to be produced at the time or, eventually, on repeat orders; two, the available equipment and working personnel for the task at hand; and, three, the ingenuity of the production manager or foreman or the shop men to figure processes and tools and distinguish between

Fig. 7 Drilling for stacked, riveted elbow sections



A - Sharp edge inward angle frame.
B - Quarter inch plate, drill holes cts'k on top.
C - Stacked elbow sections, immobile within frame.
D - Wood filler reposing on press platform.
E - Hold-down bolts, best for interchange of drill plates.

Fig. 8 Adjustable bandsawing guide jig for stacked metal



feasible, under the circumstances, employment of the foregoing to the best possible results obtainable, producing within or below the estimated cost.

To illustrate; it pays to produce one single blank by handtools, wasting no time setting up the machines or dies for same; if the quantity wanted is ten only, and if the workmen are versed in handling the common tools to advantage, it still might be best to produce the ten blanks by individual operations, such as in nibblers, slotters or rotary disk shears, or by handshears, drills, chisels and files; and if the quantity is one hundred and over, and wanted seasonally or on repeat orders, then it is to be determined whether individualized operations in available nibblers, slotters or rotary disk cutters is productively preferable to the making of drill and guide jigs, stacking the sheets and doing the work in the manner described above. If the shop contains a punch press it undoubtedly also has the common corner notching and hole punching dies; in which case individualized operations in the punch press and in the other equipment might be figured to be quicker than the other process and less costly in addition. In mass production there would be presses and dies ordered for the simplest of interior and away-from-the-straight-edge blanking, true; but sheet metal fabrication nowadays, extending also to the smaller shop, is seldom of a mass production nature. It rather is in part experimental, and in part small volume production, though it might reach into thousands of the units. Neither of the foregoing two productions warrant presses and dies as employed in mass production. Small presses, also the so-adapted press brake, are commonly at hand; and inexpensive dies are employed in these two types of production.

Choice of Method

It is seen that in interior and outer edge inward blanking (provisioning blanks, in short), the production man is taxed with choosing between three production methods in fabrication of several hundred to several thousand identical blanks. If possible, and warranted by circumstances, the press and die mode of blanking is the one to be chosen; if that is not possible or warranted, the choice must be between individualized blank production by nibblers, slotters and rotary shears, with the widest possible use of punches and drills; and the stacked metal production, by drills and bandsaw and grinders. In this connection it is in order to state that many grinding-filing tips will operate in a drill press; and that rotary nibbling or "routing" tips can be operated in the drill press to advantage, especially so if we work iron, mild steel, soft aluminum, copper or other softer metals. The sheets, reposing on the drill press platform, can be guided by the manipulator to perfection, whereas filing or grinding within the openings in blanks by hand or hand-operated grinders is risky. In what we call here individualized blanking (each sheet separate), there are liable to occur discrepancies in the edge nibbling or shearing. In the stacked metal blanking, if we provide the plate jig and guide jig, every piece of the work will come out uniformly alike.

Smaller blanks incorporating curvatures and openings which must be produced by either one of the above method, and if the metal worked is soft and thin (not over the 20-gauge), can be produced to advantage at a warranted tooling cost by *plate dies* locally constructed (see Press Brake articles by this author,

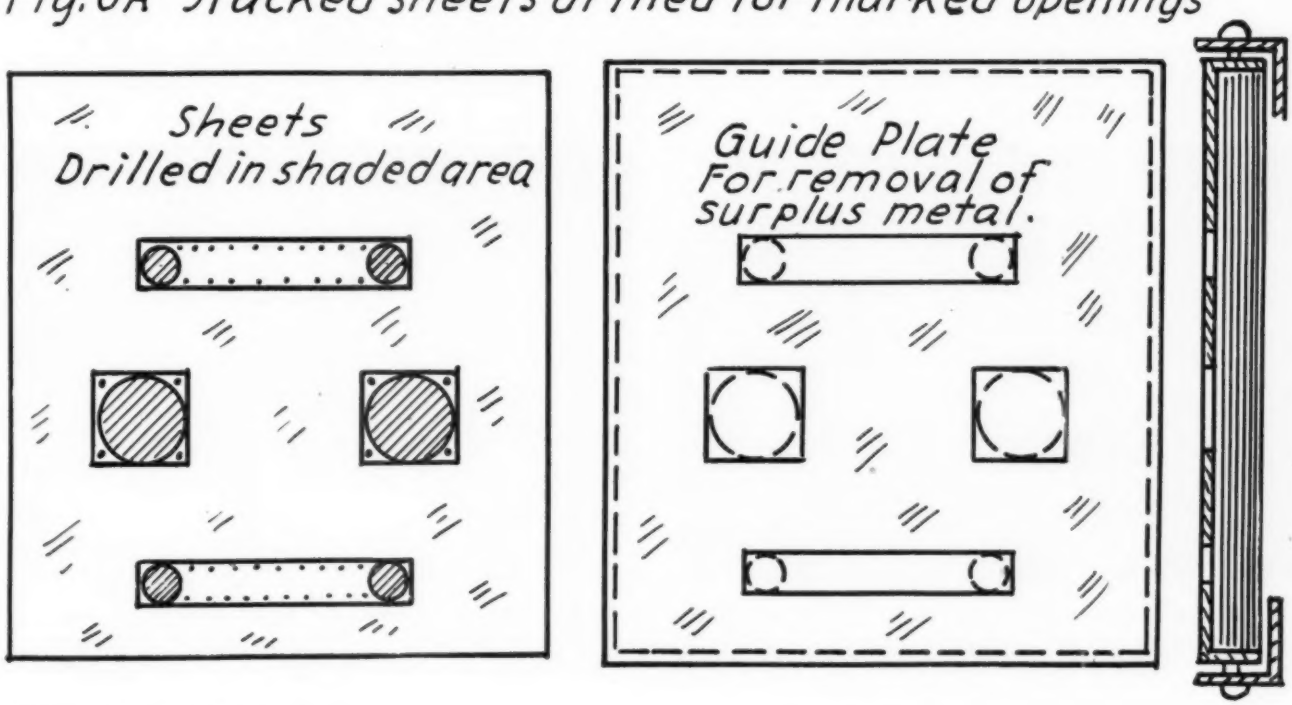
AMERICAN ARTISAN January, 1947) which incorporate not only the outer edge blanking but also interior openings and (do this blanking) by one stroke of the press. Multiple hole punching, as for riveting, can also be done by these dies, operated in either the press or the press brake. Curved shearing is another operation feasible of being productively accomplished by the described means. On the other hand, if we work stainless or the harder steels and the blanks are large, the individualized or stacked-metal production method will be preferable. In larger openings in the blank we can use the band saw as described in one of the preceding articles. Where the openings are too small for the saw blade to turn easily, eliminating multiple cuts as in a corner, the method shown in Fig. 6 and Fig. 7 will be more satisfactory. In any event, with either the saw blade or the drill doing the blanking, the plate jigs shown are of real worth. In bandsawing the openings or cutting in from the outer edge on sharp terminus, as in Figures 1 to 5, appropriate size holes should be drilled in the corners, facilitating the work of the blade in the corner, or its turning around.

Procedure for Provisioning

In up-to-date sheet metal working we do the straight outer edge blanking first, and the inward-from-the-edge and interior blanking next, so that the blank is not only cut to size and shape but also provisioned with all notches, corner cuts, slots, holes and openings, before it is forwarded to forming or other incidental operations. This provisioning is accomplished by the number of operations and tools or machines or both, alluded to above. Square shearing is performed in any case; even in press blanking. Then follows the cutting-in from the outer edge and eventual interior blanking, which is being done by either one of the many tools or contrivances mentioned. It is not within the limits of this treatise to say which tool, the rotary shear, the small disk rotary cutter, the nibbler, the laterally operating cutter, the slotter or the other machine in use or offered to the trade will do the blanking work better than the other will. What must be considered in production is that each of the above machines, like the handshears, will cut one sheet at a time. That same applies to punch press and other dies. If we can afford blanking dies that will produce the complete blank at one stroke of the press, this method is obviously to be chosen. Blanking by too many interchanges of dies is questionable: first, too much time elapses in setting the dies; second, the die-setting might vary in gage setting, involving possible discrepancies in the output.

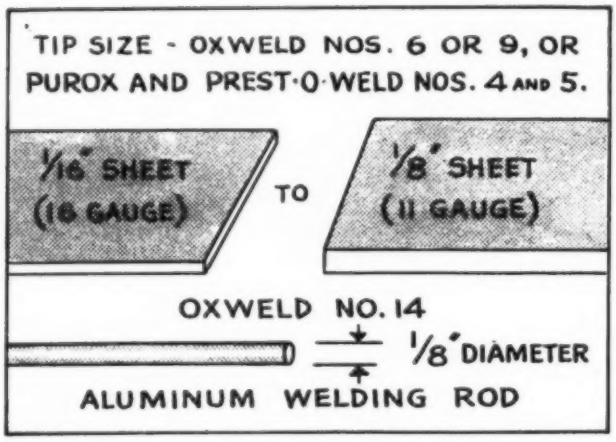
Individualized inward-from-the-outer-edge blanking is the most adhered to in the described shops. It is practiced even in auto plants (mass production), if the blanks happen to be large, such as are required for bodies. The rotary shear and the band saw are the most common tools in this work. Stacked-sheet blanking is not so good where large sheets of metal must be handled because the sheets cannot be properly held together, the one sheet slipping away from under the other in the bulk's handling. Very few drill presses have bases accommodating large size sheets or blanks, and if the stacked metal cannot be properly supported upon the base, slipping of the individual sheets in the bunch is to be expected. Therefore, and unless we have a drill press with the proper base or one with an arm extending over a bench or table top upon which the metal is securely fastened, we better abstain from this method of blanking, doing the work on each sheet individually for correctness. In aircraft plants the multiple-sheet drilling and other blanking, such as routing, is being done by fastening the sheets securely to solid planks, moving the planks along to repose on the machine's base at the point of drill contact with the metal.

Fig. 8A Stacked sheets drilled for marked openings

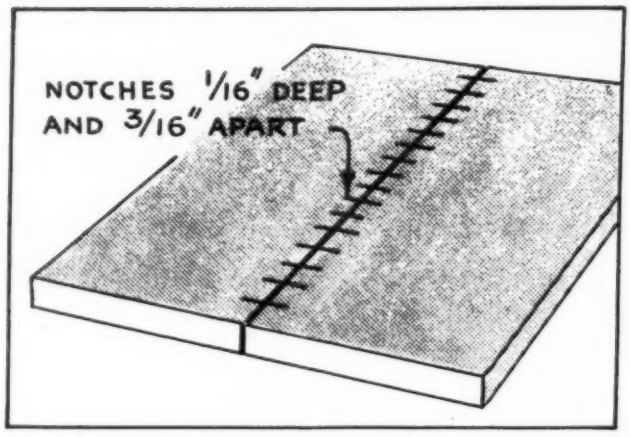


Welding Aluminum in Heavy Gauges

Reprinted from Linde Tips

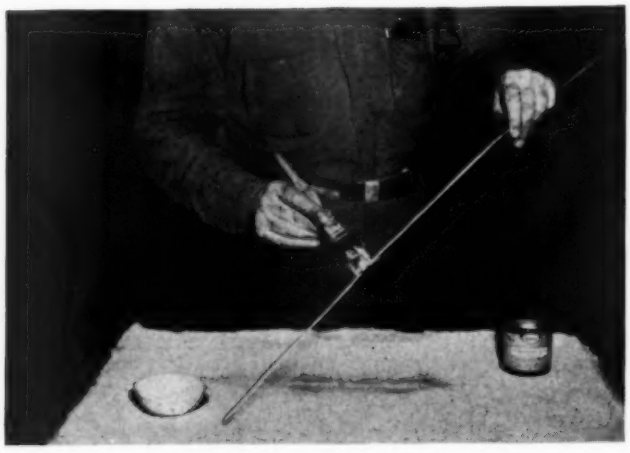


1. Oxweld N. 14 aluminum welding rod should be used for 2S and 3S grades of sheet. Flame should be adjusted to suit this rod.

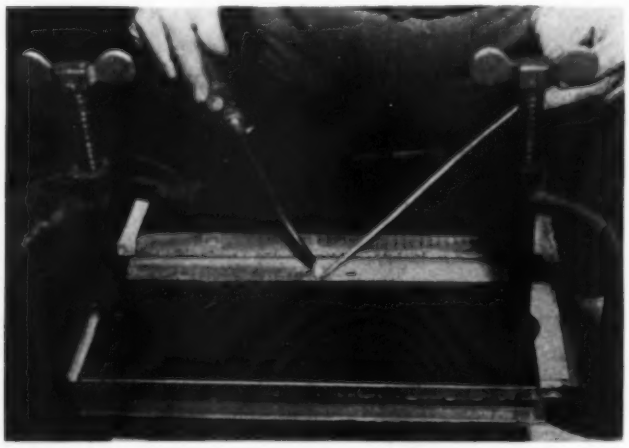


2. For 16- to 11-gauge sheet, a plain butt-type joint should be used with the edges notched to facilitate complete penetration when fusion takes place.

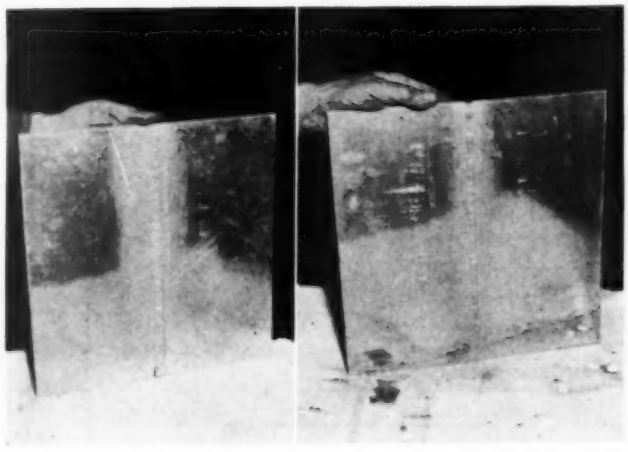
3. The notches can be made with a cold chisel and hammer. Then the sheets should be cleaned, fluxed and jigged as shown in July, 1947, AA.



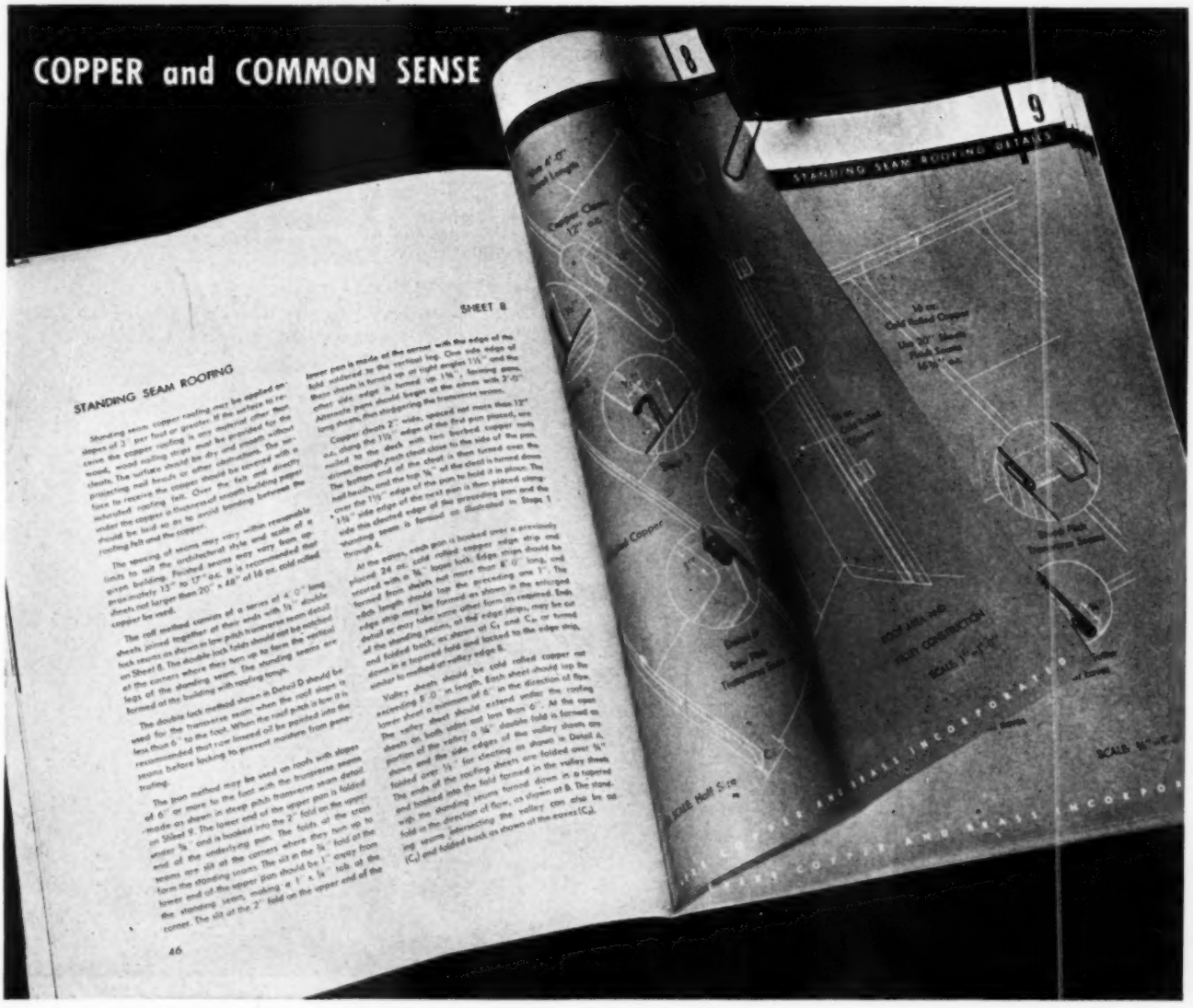
4. The rod should also be painted with flux. Some operators dip the rod in a long slender tube containing the flux and water mixture.



5. The welding rod should be held in a direct line with the weld, with the end of the rod in the flame near the metal.



6. Rapid welding produces sound weld metal with little distortion (left). Heating only a small area gives good penetration (right) without burning thru.



QUESTION: What is the best way to install standing seam roofing?

ANSWER: Detail Sheets 8 and 9, pages 46 to 49 in "Copper and Common Sense"

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ASSOCIATION ACTIVITIES

Canadian Chapter NWAH&ACA

THE annual meeting of the Canadian Chapter of the National Warm Air Heating and Air Conditioning Association is planned for the second week in December in Quebec City. The general meeting, open to all members and associate members, is tentatively scheduled for Thursday, December 11.

The Canadian Chapter is young, being founded in June, 1944. Much has been accomplished during the past three years. More progress should be forthcoming during the next three years.

The August News Letter calls attention to Circular F6.2 "Moisture-Condensation." published by the Small Homes Council, University of Illinois, Urbana.

A supply of "How, What and Why" of the New Code and Manual for the Design & Installation of Warm Air Winter Air Conditioning Systems is maintained for the convenience of members and an order form accompanies the August News Letter.—C.B. Taylor, Man. Dir., Royal Bank Building, Yonge at Deloraine, Toronto 12, Ontario.

ASRE 1947 Meeting

THE 43rd Annual Meeting of The American Society of Refrigerating Engineers will be held in Atlantic City, New Jersey, December 8 to 10, 1947. R. H. Money is president of the Society. Headquarters of the meeting will be the Hotel Traymore.

Highlights of the three-day session include a paper by L. C. Marshall, division of electrical engineering at the University of California, speaking on technical factors in greenhouse air conditioning. Other topics on the program include papers on refrigeration as applied to concrete dams, storage of edible nuts, and papers on the heat pump.

The Philadelphia Section of the Society will act as host for the occasion, with plans for other entertainment features now under way.

New York

THE Roofing and Sheet Metal Crafts Institute has in process a Master Plan expected to provide members who follow its policies with strong support and added prestige in their dealings with present and future clients. Advantages are unlimited, because it will be worked on consistently and changes will be made whenever newer and better ideas can supplement outmoded practices.

In the case of the Standardization of Guarantee which will be one feature of the plan, an Institute-backed and promoted guarantee which promises no more than it intends to promise will be an effective answer to fly-by-night and come-on promises.

Another important part of the plan relates to labor with questions submitted to the Institute with the view toward improving the relationship between the workers in these trades and the contractors and extending good practices. Efforts will be made to keep men in permanent employment and to reduce hardship resulting from unemployment. The highest expression of our democracy, it is pointed out in the plans, is to consider neither the laborer nor the employer as separate and fixed classes, but rather each be considered as a status that can be changed one way or another by such factors as industriousness, intelligence, ambition and luck.

Further details on the Master Plan will appear in subsequent issues of the "Institute Ticker."

Meetings are held the second and fourth Wednesdays each month, with dinner at the Port Tavern, 108 Eighth Avenue at 6 p. m.

St. Joseph Valley

THE St. Joseph Valley Furnace and Sheet Metal Contractors, Inc., held their monthly meeting recently and installed new officers for the ensuing year.

Installed were J. R. Walker, president; Russell Sisson, vice-president; Burton Walker, secretary; J. W. Lauber, Jr., treasurer.

In discussing the program for the coming year, President J. R. Walker pointed out the need once again for a heating inspector for South Bend and vicinity and announced that they would attempt to have a city official attend the next meeting for further discussion of the matter.

A committee was also named to investigate illegal heating installation in this area.

Several applications for membership into the organization will be voted upon at the October 6 meeting. —William R. Tesky, Publicity Director

Coming Conventions

1947

Dec. 3 — National Heating Wholesalers Association. First Annual. Hotel Cleveland, Cleveland. E. J. Eckstein, Secy.-Treas., 526 Galveston Avenue, N. S., Pittsburgh 12.

Dec. 4-5—National Warm Air Heating and Air Conditioning Association. 34th Annual. Hotel Cleveland, Cleveland, Ohio. Geo. Boeddener, Man. Dr., 145 Public Sq. Bldg., Cleveland 14.

Dec. 8-10—The American Society of Refrigerating Engineers. 43rd Annual. Hotel Traymore, Atlantic City. R. H. Money, Pres., 40 W. 40th St., New York 18.

Association Activities . . .

Detroit

THE regular monthly meeting of the Detroit Warm Air Heating & Air Conditioning Contractors was held at the Fort Shelby Hotel August 14th.

President VanAssche opened the meeting and turned it over to Secretary Jay Biddle for his comments. The minutes of the previous meeting were approved as read.

The labor insurance report was read and approved—meaning that all employers will now insure their employees for sickness and accident.

A very enjoyable time was had by about sixty members and their wives on a recent boat trip to Mackinac Island. They left Friday evening and arrived home the following Monday morning, happy but tired.

The fuel oil shortage is still bad in this territory and a motion was made and carried that the Association contact the major oil companies to see what can be done for their members in regard to getting more oil contracts.

Due to the oil shortage a large number of oil burner owners are now installing an extra tank. This, coupled together with the fact that there is still a shortage of steel in this area for the manufacture of these oil tanks, makes them really hard to get.

According to newspaper reports the Consumers Power Company of Michigan will not have additional gas for home heating for at least two or three years because of the shortage of pipe line facilities. The boys are still hanging on to their gas equipment hoping that the manufacturers may be induced in the near future to take them back.

The treasurer's report was good, and the members hope it will stay that way because of the money that is going to be required for the coming State Convention.

The meeting was adjourned, and the members partook of refreshments furnished by the Milcor Steel Company and very ably presided over by Baldy Hoffman.

Frank Roberts is back on the job after a motor trip to Montreal. Ernie Simmons was at the meeting after a long absence up-state. Mrs. Mary Walters of the American Furnace Company has an eight-pound, three-ounce baby boy and is fine.

Tom Ginley, president of the Detroit Safety Furnace Pipe Company, passed away at his home Saturday, September 13th. Tom was one of the old school who believed that work was a necessary part of the scheme of life. He was with his company for 54 years and will be long remembered by the many warm air heating contractors who had occasion to call on him.

We understand that Joe Wilder is now the new National association secretary.

The FHA is now recommending enameled or insulated smoke pipe for pot type burners without fans.

The annual golf party sponsored by Joe McLaughlin of the Superior Safety Furnace Pipe Company was held September 25th at Gowenie Golf Club, Mt. Clemens, Michigan.

Birdsall Heating reports they did not sit down and cry when they found there were no more oil contracts, but went to work and got a new building project job using 140 coal-fired air conditioning units.

McRae Heating is also going strong on new homes.

The best thing the boys can do now is to sell coal-fired air conditioning units which can be changed later to oil or gas. The loss of efficiency will not amount to very much and the owners will not be tied down to any one fuel.—W. O. Smith.

Institute, Chicago

THE sixteenth annual basket picnic staged by the Furnace, Air Conditioning Sheet Metal Institute at Long Lake Park, Long Lake, Illinois, on July 13, is successful past history, largely due to the generous purchase of picnic tickets by supply house friends, listed on the back of the picnic program.

The picnic committee included Tom Novak, chairman, B. B. Barker. Ernie Munsterman, Mr. Downey, Barney Sanders, Art Johnson, Dale Carr, Lou Reining, Ed. Fiebrandt, Rudy Guenther, Marv. Laurentz, Carl Woerner, Ferd Sonneker, Roland Tippet, and A. Kleinrath.

Non-members are invited to attend a meeting and see how this organization is protecting the interests of the independent furnace and sheet metal contractor. Regular meetings are held every second and fourth Friday at the Institute Research Home, 1916 W. Fullerton Avenue, Chicago.

A special 10-night warm air education program is being arranged by the Educational Committee, under the direction of Barney Sanders.—Arthur Johnson, Secretary, 3437 N. Clarement Ave., Chicago.

Milwaukee

AN OPEN meeting to which all associate members were invited was held Tuesday Evening, September 9, by the Milwaukee Sheet Metal Contractors Association, Inc., with a capacity house attendance.

Louis L. Narowetz of the Narowetz Heating & Ventilating Company, Chicago, told about jurisdictional awards, machinery and tools, aluminum, and old timers.

J. D. Wilder. new National Executive Secretary who needed no introduction, outlined the activities of the Sheet Metal Contractors National Association.—Paul L. Biersach, Secretary.

Thomas Ginley

The sheet metal industry of metropolitan Detroit feels a very deep loss in the passing of Thomas Ginley, president of the Detroit Safety Furnace Pipe Company, who died Saturday, September 13, 1947, at his home, 4193 Burns Ave, after a brief illness.

Tom was one of those sterling individuals whose word was better than most people's bond and a very genial and kindly man.

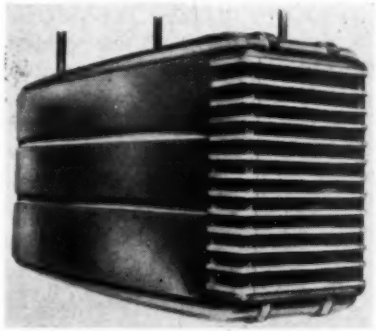
He was born in Canada 75 years ago and for over half a century had been identified with the sheet metal industry in Detroit, as an employee and esteemed executive of the Detroit Safety Furnace Pipe Company.

EQUIPMENT DEVELOPMENTS

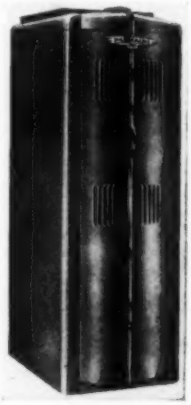
145—Suspended Heater

The Pacific Suspended heater, designed by a West Coast industrial designer, contains all working parts within a streamlined body, for use in stores or shops.

The heating element, fan assembly and gas controls are all enclosed. No ducts are required. The heater is suspended, directing by fan a spread of warm air downward. An exclusive feature is the Thermo-Flo.—*Naco Manufacturing Co., 7631 Roseberry Ave., Huntington Park, Calif.*



146—Palmaire



The Palmaire gas fired forced air furnace, compactly designed for the average home where ducts are used for warm air distribution, has an all-steel, press - formed, streamline cabinet with silent corrugated steel lining, heavy gauge die-formed steel elements, baked enamel steel burners, automatic controls, spun glass air filter, 1000 cfm blower and a Hammertone blue, baked enamel finish with chrome trim. Over all size is 18Wx27Dx55 in. H.

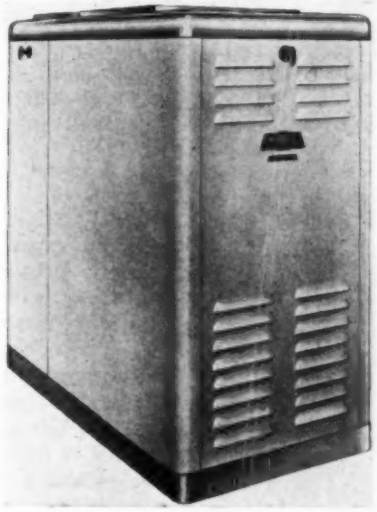
Powered by a heavy duty motor, the model has an approximate 80,000 Btu input. Natural, LPG, or manufactured gas can be used.

All controls are accessible by finger tip front panel removal. Thermostatic equipment is supplied. —*The Palmer Manufacturing Corporation; 705 W. Jefferson St., Phoenix, Arizona.*

Use the Coupon on Page 128

147—Thermo-White

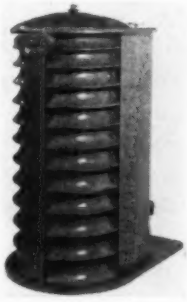
A new oil-burning winter air conditioning furnace has large prime heating surfaces, based on proved thermal research findings. Two flush sides provide access to interior. Standard equipment includes fan and limit control; barometric draft control; lightweight insulating refractory combustion chamber; and float automatic humidifier.



The Thermo-White is finished in white enamel with forest green trim to match water heaters, softeners and water systems, and is available in 112,000 and 160,000 Btu output at the bonnet.—*Wayne Home Equipment Company, Inc., 801 Glasgow Ave., Fort Wayne 4, Ind.*

148—Down-Glow Heater

A Down-Glow radiant air heater combines radiant and convection heating for uniform warmth through a scientifically designed parabolic deflector grille, and produces approximately 50,000 Btu per hour from ½-gallon of oil. The minimum burning rate is about ⅓ gph.



The front deflector assembly slips off with simple hand pressure.

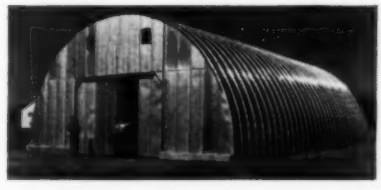
The Winkler unit has a baked enamel finish.—*U. S. Machine Corporation, Lebanon, Indiana.*

149—Resistance Indicator

Distributors of Dust-Stop air filters are furnished a draft gauge for use by their commercial and industrial installation customers in determining when their air filters should be replaced.—*Owens-Corning Fiberglas Corporation, 718 Fifth Avenue, New York 19.*

150—Aluminum Prefab

Of all-aluminum construction, the Alumi-Drome employs standardized 6-foot sections which allow the length to be varied as desired. The individual arch sections can be raised into position after assembly on the ground. They are anchored to a concrete foundation extending one foot above ground level. Longitudinal members lock into the arches to form rigid frame work.



After frame is erected, sheathing sheets are attached to ends and curved barrel section. These sheets are flanged at both sides to turn up into hat-shaped channels which bolt down to the framing members. Sheet ends fit into tight S-type locking members. Main arches are spaced at 6-foot intervals, intermediate framing at 2-foot intervals to receive a 2-foot wide sheathing.

When properly grounded, it affords protection against lightning. Doors are inside sliding.—*Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.*

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 128

151—Hi-Boy

Model 14 Superfex gas-burning Hi-Boy covers an area less than 2 feet square and uses natural, manufactured or liquefied petroleum gas.

Automatic controls tend the Hi-Boy. A three-stage thermostat acts as watchman of comfort. The instant the temperature falls below the thermostat's setting, a constant *pilot* fire starts a *coasting* fire. If the coasting fire is unable to satisfy the thermostat, a second burner or *booster* fire goes on. When the house temperature has leveled off, the fire is cut back to coasting. Warm air is distributed by a two-speed blower.

A safety Pilotstat prevents the flow of gas if the pilot goes out. A limit control cuts off the burners if the plenum chamber exceeds a certain temperature.

The two gas burners have a combined maximum input of 75,000 Btu, with an output of 60,000 Btu at the bonnet.

The Superfex Hi-Boy embodies the "Homogen-Air" heating design which assures balanced heat, with as little as four degrees variation from floor to ceiling. It is neatly cased in silvertone brown.

The Superfex Hi-Boy may be had in the oil-burning Model 94.—*Perfection Stove Co., 7609 Platt Ave., Cleveland 4.*

152—ALCOA

Alcoa Industrial Roofing is a lightweight, heavy-duty, specially-formed material developed to meet the demand for an aluminum roofing and siding specifically adapted to factories, warehouses and similar structures; to carry heavy loads and meet the exacting requirements of building codes.

Made from a special aluminum alloy, the new material combines high strength, high resistance to industrial atmospheres, minimum maintenance and reduced roof load. Alcoa Industrial Roofing will have a covering width of 32 inches, allowing for a side lap of 1½ corrugations. It will come in standard 5-foot through 12-foot lengths, .032 inch thick.

Industrial aluminum siding of the same alloy and lengths as the roofing will have a coverage of 32 inches and will meet code requirements for siding materials.

All necessary fittings and accessories such as ridge roll, flashings, rivets, nails, straps, etc., will be supplied.

Alcoa engineers reveal that the new product meets safe load requirements (using a factor safety of 2), ranging from 30 pounds per square foot uniformly distributed load on 6 ft. 5 in. purlins up to a 105-pound load on 3 ft. 6 in. purlins.—*Aluminum Company of America, 801 Gulf Building, Pittsburgh 19.*

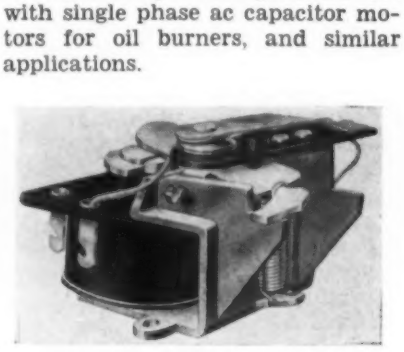
153—Comfortaire

Norbert Shaeffer has designed a new winter air conditioner to use the minimum floor space for utility rooms or service porches, with an overall height of 60 inches, a width of from 20 to 28 inches, and a depth of 27 inches. The Comfortaire maintains an hourly output of from 60,000 to 120,000 Btus, depending on the model.

The Comfortaire includes a switch for summer ventilation, renewable air filters and a fan and limit switch as standard equipment. —*Hammel Radiator Engineering Company, 3348 Motor Ave., Los Angeles 34.*

154—Relay

A new relay is designed for use with single phase ac capacitor motors for oil burners, and similar applications.

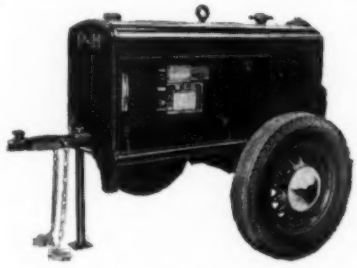


Bulletin 109 relay assures positive and reliable motor performance, and operates over a wide range of voltages. Chatterless relay operation is obtained through its magnetic circuit design.

Contacts are single pole normally closed suitable for a load as large as a 1 hp, 115 or 230 volt, 60 cycle capacitor motor. Bulletin 109 relays measure approximately 1½ in. high by 1¾ in. wide by 1⅛ in. long.—*Ward Leonard Electric Co., 31 South St., Mount Vernon, N. Y.*

155—Portable Welder

A new self-powered arc welder—the P&H Model WN-200, available as a stationary or trailer unit—N. E. M. A. rated 200 amperes, but with a welding service range



P&H Model WN-200
Trailer Welder

of from 30 to 260 amperes, has been designed for shop, yard and field service.

Running reflecters are attached to the trailer body for safety on the highway. A ball and socket hitch and safety chains are provided.

Both models are equipped with generators. There is one control for any desired welding heat from minimum to maximum capacity. Arc response is automatic and with all types of electrodes. The WN-200 has "Visi-matic" calibration plates which enable the operator to select the exact current for each of the three classes of electrodes — *Harnischfeger Corporation, 4400 W. National Ave., Milwaukee 14.*

156—Clean Sweep

A light weight soot remover has been developed, to follow all flue passages and inaccessable soot-coated surfaces.

This cleaner is non-explosive, does not generate high temperatures, is completely combustible (thus leaving no residue), and will not corrode or injure any heating unit. It is especially suited for use in vaporizing and pot-type burners. —*The Clean Sweep Company, P. O. Box 156, South Lansing 9, Mich.*

You never can tell till you ask

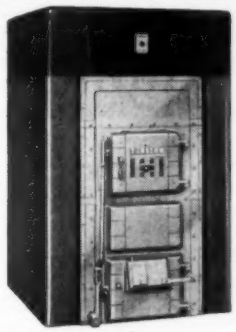
MAYBE your Wholesale Distributor couldn't supply your requirements for these popular American-Standard units when you called him last week. But perhaps he can today.

We're getting increased production of Sunbeam Warm Air Furnaces and Winter Air Conditioners at American-Standard, and it is likely that your Distributor will soon have more of them.

We suggest that you keep in close touch with him, so that you'll be in a position to take immediate advantage of the wide demand for these quality products.

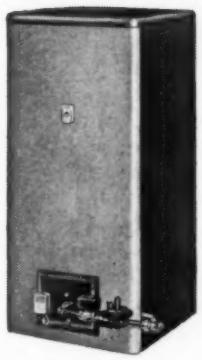
American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pennsylvania.

The KENWOOD. A cast iron furnace for coal, in pipe and pipeless types. Tight joints prevent smoke and soot escaping into the air heating chamber. The one-piece radiator is oversize for increased capacity and efficiency.



The ARLINGTON "SQUARE" Warm Air Furnace. Heating element and extra large radiators are of heavy boiler plate steel. Has full height fire box and duplex grates. Made in 20", 22", 24" and 27" shell diameters. For coal, (hand-fired or stoker) or oil.

GRAVITY FURNACES

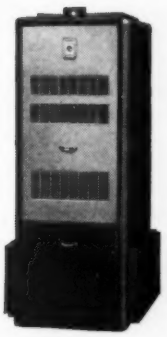


The SHAWNEE. A gravity furnace for natural, manufactured, mixed or liquefied petroleum gas. Has a copper bearing steel heating element. Incorporates design and construction features that insure efficient, long-term service. In five sizes, ranging from 65,000 to 140,000 Btu. input per hour.

The SARATOGA Winter Air Conditioner. A modern, low-priced oil fired unit for small homes. Features heating element of heavy boiler plate steel with riveted and welded seams. Compact jacket encloses blower-filter unit and heating element . . . also provides space for concealed burner.

WINTER AIR CONDITIONERS

The MOHAWK Winter Air Conditioner burns natural, manufactured, mixed or liquefied petroleum gas. Burner is of cast iron with patented high temperature alloy, corrugated ribbons. Cast iron heating element has precision ground faces and leakproof joints.



The WYANDOTTE (Automatic) Winter Air Conditioner for natural, manufactured, mixed or liquefied petroleum gas. Ideally suited for first floor or basement installation where space is at a premium. Has copper bearing steel heating element. In six sizes—from 55,000 to 150,000 Btu. input per hour.

AMERICAN-Standard
HEATING · PLUMBING

Serving the Nations' Health and Comfort

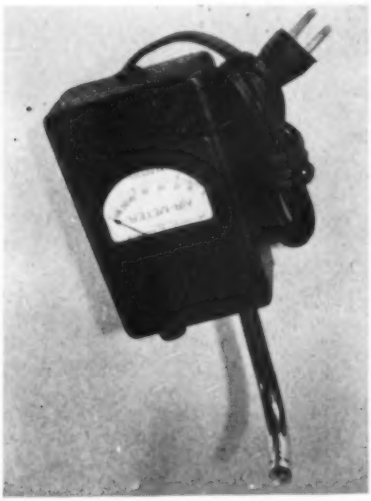
LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 128

157—Velocity Meter

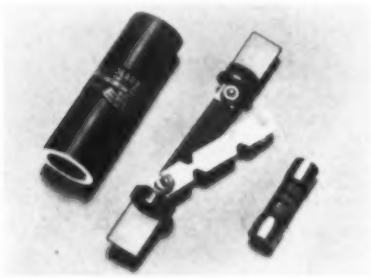
An ultra-sensitive air velocity meter which will measure air velocities as low as five feet per minute, is offered. The Air Meter is applicable to the measurement of velocities in ducts, wind velocities, flow in air and gas lines, and surveys of heating and air conditioning systems.



This instrument operates from 110 volts AC power. The standard range is from 0 to 2000 feet per minute. Fifty feet per minute is approximately 20 per cent of full scale.—*Hastings Instrument Company, Inc., P. O. Box 1275, Hampton, Virginia.*

158—Cartridge Fuses

A new line of renewable cartridge fuses, designed for shockproof servicing and rapid renewal, is distributed under the trade-name "Solar." The knife-blade-type fuse has only two main parts: a cartridge case and a link-blade assembly.



Solar shock-proof renewable cartridge fuses are available in sizes from 3 to 600 amperes, 250 or 600 volts; Underwriters Laboratories, Inc., approved.—*Solar Electric Corporation, Warren, Pa.*

159—50 KVA Welder

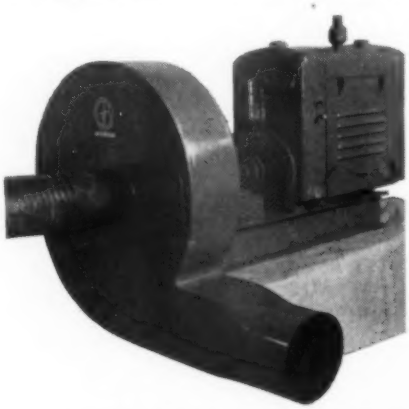
A newly designed 50-KVA spot welder, engineered for maximum production speed, contains eight ranges of heat selection with easy-to-reach external adjustment.

Where repeat operation is used, the free action of welder and low inertia of rocker arm enable operator to space spots to produce a clean, uniform job. Specifications for foot or air-operated spot welder are available.—*Banner Products Co., 4914 N. 29th St., Milwaukee 9.*

160—Giant Furnace Cleaner

A manufacturer of air and dust removal equipment has designed a giant furnace cleaner unit of heavy all-welded construction, set on a base and balanced to rest on truck on "even keel."

Specifications include a 4-cylinder gasoline motor of 18 hp maximum, hand-throttled, and equipped with electric self starter operating off the truck battery.

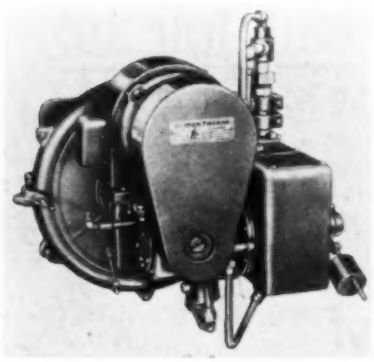


The equipment includes a 50-foot 8-in. diameter wire bound rubber hose, a heavy canvas bag thirty feet long and six feet in diameter when inflated, and a 20-gauge 12-in. diameter galvanized iron pipe between exhauster and bag.—*General Blower Company, 8600 Ferris Avenue, Morton Grove 5, Ill.*

161—Oil Control

A new principle of heavy fuel oil control is incorporated in a new series of industrial heavy fuel oil burners to stabilize the feeding rate of fuel, regardless of changes in fuel oil temperature or viscosity. These new burners have capacities from 8 to 125 gallons per hour.

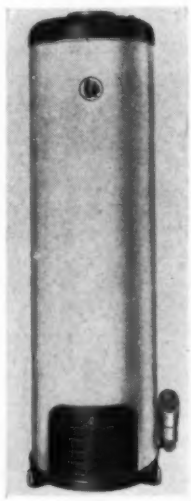
"Even though the fluidity can vary widely with changes in temperature, these burners will deliver the same quantity of oil no matter how thick or thin,



These rotary-cup type burners supplement Iron Fireman's industrial line of coal stokers for power, processing and heating.—*Iron Fireman Manufacturing Co., 3121 W. 106th St., Cleveland 11.*

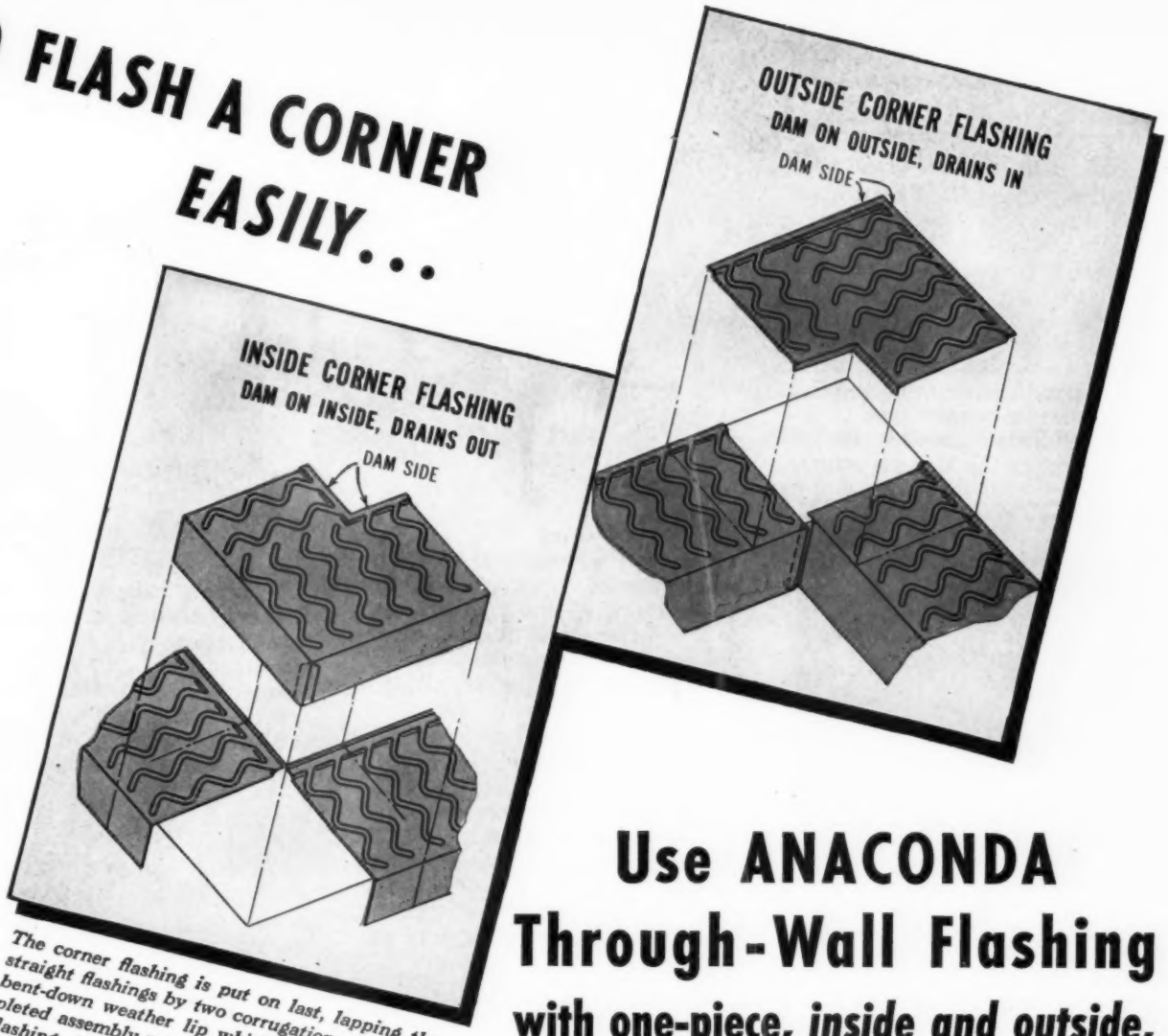
162—The Chief

A new oil-fired water heater—The Chief—is completely automatic and has a high lustre baked enamel outer shell.



Features are the 7-inch pressed steel, gravity type oil burner; 20-gauge steel outer casing; tank galvanized inside and out with a 12-gauge shell, 10-gauge top head; 7-gauge bottom, and 10-gauge flue wall; automatic, thermostatically controlled oil valve; instant action, constant level oil control with water temperature adjustment; easily released, heavy steel burner support; recovery 33 gallons per hour (60 degree rise). Capacity 25 or 35 gallons. Uses No. 1 fuel oil. Approved by Underwriters Laboratories, Inc.—*Mt. Pleasant Heater Corporation, Dept. 12, 710 S. Oak St., Mt. Pleasant, Mich.*

TO FLASH A CORNER EASILY...



The corner flashing is put on last, lapping the straight flashings by two corrugations. Note the bent-down weather lip which makes the completed assembly water-tight. In ordering corner flashings, be sure to specify whether dam should be inside or outside.

Use ANACONDA Through-Wall Flashing with one-piece, *inside and outside*, corner flashings

ANACONDA THROUGH-WALL FLASHING is designed to provide positive drainage, a strong mortar bond and long-lived protection ... and also to make the sheet metal contractor's work as easy as possible.

This copper flashing that *drains itself dry* is carried in stock for 8- and 12-inch walls in five-foot and eight-foot straight lengths, together with corner pieces for both inside and outside drainage. These corner pieces are so designed that the corrugations interlock with those of the adjoining straight sections, providing the same thorough drainage, watertight joints and firm mortar bond at the corners as in the main part of the wall. The flat selvage on both straight lengths and corner pieces is an aid in making neat, sharp bends for counter flashing or for locking to adjacent metal.

For detailed information on Anaconda Through-Wall Flashing, write for Publication C3,SA. 4761

ANACONDA
from mine to consumer

Anaconda
COPPER

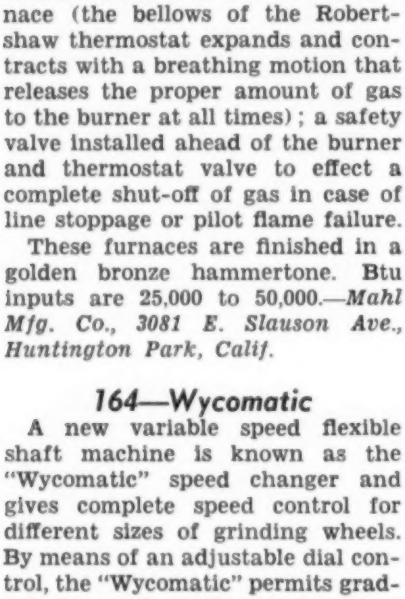
THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD.,
New Toronto, Ont.

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 128

163—Dual Floor Furnace

The Saratoga Dual floor furnace has a heavy duty heating element with fire box of 11 to 16-gauge copper bearing Thermplate. Other features are: the Moduflame which goes into action when the thermostat calls for heat, then modulates back to a small stand-by flame which keeps the air moving through the furnace; a bellows type throttling thermostat operated by the temperature of the air as it returns



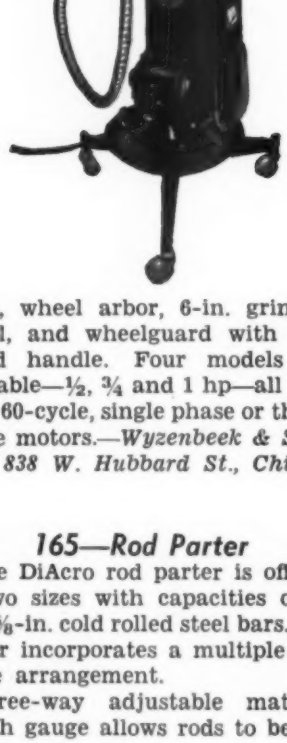
into the control section of the furnace (the bellows of the Robertshaw thermostat expands and contracts with a breathing motion that releases the proper amount of gas to the burner at all times); a safety valve installed ahead of the burner and thermostat valve to effect a complete shut-off of gas in case of line stoppage or pilot flame failure.

These furnaces are finished in a golden bronze hammertone. Btu inputs are 25,000 to 50,000.—*Mahl Mfg. Co., 3081 E. Slauson Ave., Huntington Park, Calif.*

164—Wycomatic

A new variable speed flexible shaft machine is known as the "Wycomatic" speed changer and gives complete speed control for different sizes of grinding wheels. By means of an adjustable dial control, the "Wycomatic" permits gradual change from slowest to fastest speed.

A safety cabinet swivels on ball-bearing motor base and encloses the speed change mechanism and belt guard. Low center of gravity prevents tipping, eccentric lock holds handpiece so securely that machine can be used as stationary grinder, and there is an eccentric adjustment on jackshaft for belt tightening. The Wycomatic is equipped with WYCO precision shaft containing the patented non-metallic innerliner, precision hand-



piece, wheel arbor, 6-in. grinding wheel, and wheelguard with outboard handle. Four models are available—½, ¾ and 1 hp—all with 50 or 60-cycle, single phase or three-phase motors.—*Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago 22.*

165—Rod Parter

The DiAcro rod parter is offered in two sizes with capacities of ⅜ and ⅝-in. cold rolled steel bars. The cutter incorporates a multiple leverage arrangement.

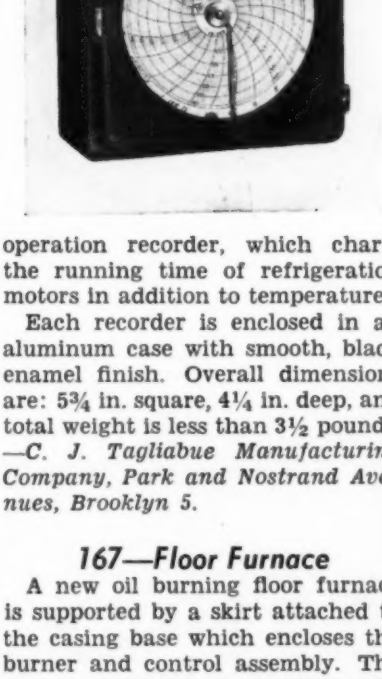
Three-way adjustable material length gauge allows rods to be po-

sitioned and parted with precision. Material capacity for Rod Parter No. 1 is 1/32 to ⅜ in. round steel bar; for No. 2, 1/16 to ⅝-in.

Cutting heads are of heavy alloy tool steel, hardened and precision ground, and are reversible. They can be easily removed for resharpening and quickly replaced.—*O'Neil-Irwin Manufacturing Company, Lake City, Minn.*

166—Temperature Recorder

A miniature-size temperature recorder—shock-resistant—is available in two forms: the single-pen recording thermometer and the two-pen temperature and time-



operation recorder, which charts the running time of refrigeration motors in addition to temperature.

Each recorder is enclosed in an aluminum case with smooth, black enamel finish. Overall dimensions are: 5¾ in. square, 4¼ in. deep, and total weight is less than 3½ pounds.—*C. J. Tagliabue Manufacturing Company, Park and Nostrand Avenues, Brooklyn 5.*

167—Floor Furnace

A new oil burning floor furnace is supported by a skirt attached to the casing base which encloses the burner and control assembly. The casing and skirt are finished with high-heat, high gloss silver-gray enamel and brown trim.

The drums, base and double inner-liners are made of corrosion-

resistant and heat-reflectant *aluminized* steel and the casing is bonderized before enameling. Other features include a burner designed for poor draft conditions, a complete double liner for air circulation, and a design that permits easy moving of burner and control assembly to floor for servicing.—*Gilcor Products Corporation, Dowagiac, Mich.*

NOW The HEIL *Focused-Flame*

gives even smallest units

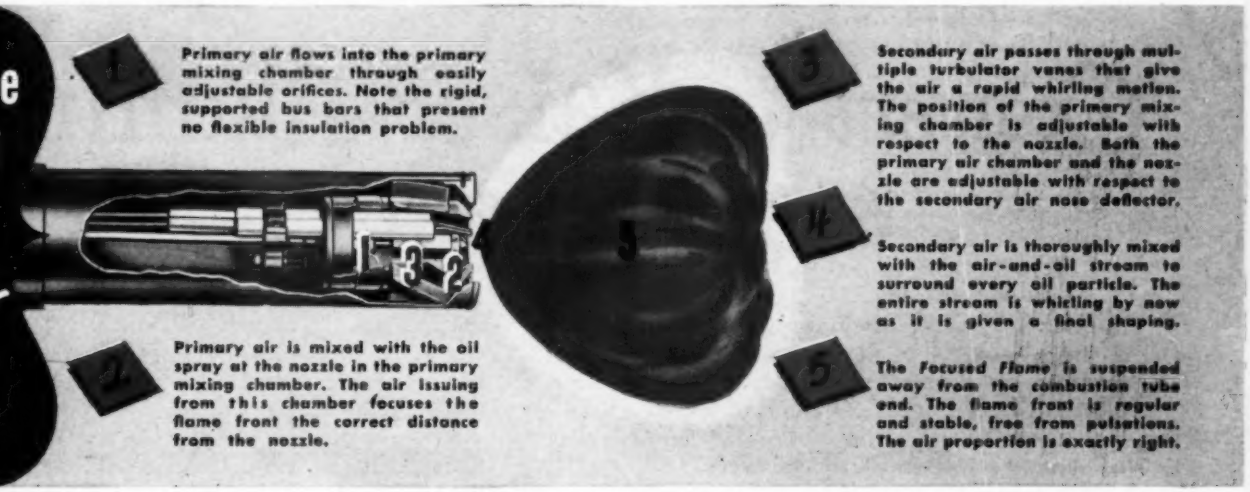
TOP COMBUSTION EFFICIENCY

NEW HEIL COMBUSTION HEAD PRODUCES BETTER THAN 10% CO_2 EVEN IN SMALL DOMESTIC UNITS

Here is a startling example of Heil combustion engineering. The new Heil *Focused Flame* Combustion Head—the product of years of experimentation and testing in the Heil laboratories—brings top efficiency to low-firing-rate burners. The new catalytically cracked fuels hold no terrors to this amazingly efficient head.

Here is a powerful sales weapon to help you sell Heil Oil-fired Winter Air Conditioners, Boiler-Burner Units, and Conversion Burners. But more than that, the Heil *Focused Flame* head has been designed to eliminate causes of trouble, and to simplify servicing and adjustment . . . you benefit in every way from Heil engineering.

Here's the secret of the HEIL *Focused-Flame*


1
Primary air flows into the primary mixing chamber through easily adjustable orifices. Note the rigid, supported bus bars that present no flexible insulation problem.
2
Primary air is mixed with the oil spray at the nozzle in the primary mixing chamber. The air issuing from this chamber focuses the flame front the correct distance from the nozzle.
3
Secondary air passes through multiple turbulator vanes that give the air a rapid whirling motion. The position of the primary mixing chamber is adjustable with respect to the nozzle. Both the primary air chamber and the nozzle are adjustable with respect to the secondary air nose deflector.
4
Secondary air is thoroughly mixed with the air-and-oil stream to surround every oil particle. The entire stream is whirling by now as it is given a final shaping.
5
The *Focused Flame* is suspended away from the combustion tube end. The flame front is regular and stable, free from pulsations. The air proportion is exactly right.

ANY WAY YOU LOOK AT IT—HEIL IS THE LINE FOR YOU

The new Heil Oil-fired units are packed with sales features to make selling quick and easy—and Heil's performance record backs them up. Heil gives you engineering and styling that can't be beat—and adds a powerful merchandising program to give you complete assurance of more profit with a Heil franchise.

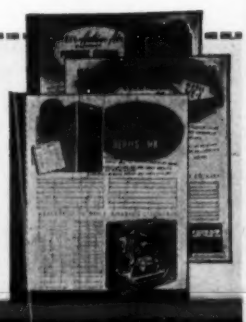
HURRY . . . YOUR TERRITORY MAY STILL BE OPEN

Send the coupon today and get the facts about the brilliant new Heil line and details about the Heil franchise. Take the first step now toward an association with a firm with a quarter-century reputation for fine oil-fired equipment and fair honest dealing.

THE HEIL CO., Dept. A-10
Milwaukee 1, Wisconsin

Please send me your new dealer specification sheets showing full color reproductions of Heil 1947 Boiler and Furnace-Burner models with complete details about a Heil franchise and openings in my territory.

Name .....
Company .....
Address .....
City ..... Zone ..... State .....



THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

Manufacturers of Quality Automatic Heating Equipment Since 1924

If shortages have you over a barrel . . .

And your competitor's giving you a licking . . .

Convert to Kaiser Aluminum

(you can bet your competitor did!)

You don't *have* to take a beating because of shortages . . .

You can get Kaiser Aluminum Utility Sheet. And at less cost than any aluminum ever produced for sheet metal men!

But price isn't the only reason scores of alert fabricators have turned to this new aluminum sheet . . .

They've discovered the *ease* with which they can improve their products with Kaiser Aluminum — in so many ways.

Kaiser Aluminum Utility Sheet can be handled like any sheet metal. For instance, among its sturdy qualities is the ability to take a Pittsburgh Lock Seam.

It helps cut labor costs because it's easy to form and to fabricate. Further, it can't warp or rust, and it stubbornly resists corrosion.

Its beauty lasts, too. The sparkling bright appearance of Kaiser Aluminum Utility Sheet can add extra *sell* to your products.

Aren't these advantages worth investigating?

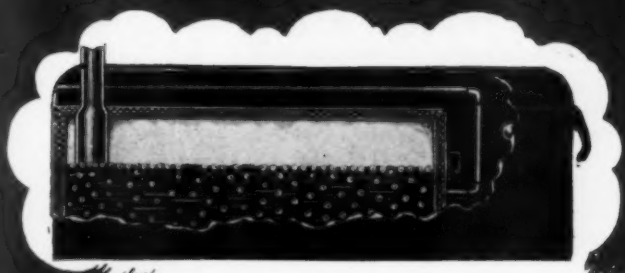
Call the Permanente distributor nearest you today. He can show you *more* ways Kaiser Aluminum Utility Sheet can help you.

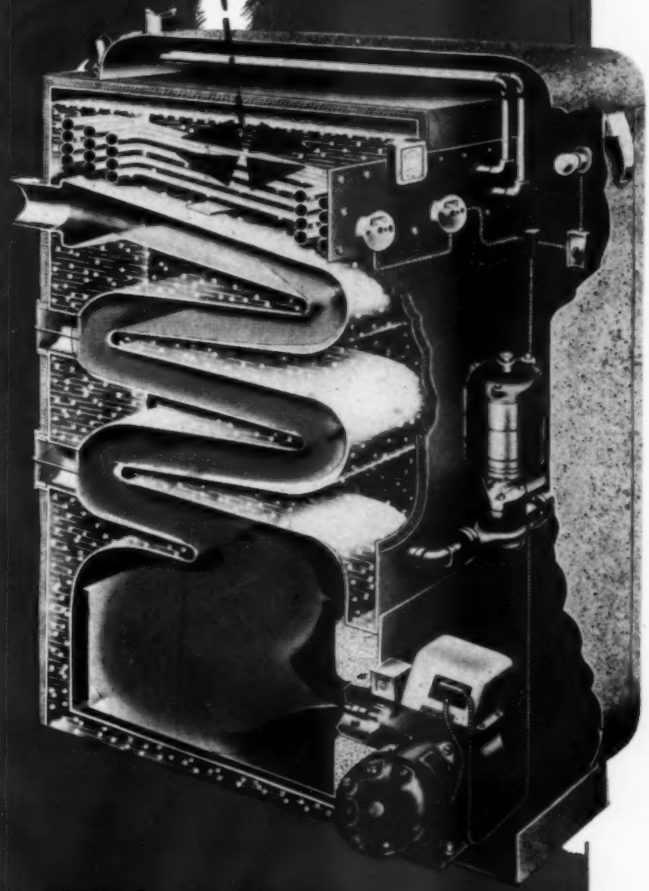
Kaiser Aluminum Utility Sheet

a Permanente Metals product

DISTRIBUTED BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND, CALIFORNIA . . . WITH OFFICES IN:
Seattle • Oakland • Los Angeles • Dallas • Wichita • Kansas City • St. Louis • Atlanta • Minneapolis • Milwaukee • Chicago
Cincinnati • Cleveland • Detroit • Boston • Hartford • Buffalo • New York City • Philadelphia • Washington, D. C.

The CASE of the "MISSING" TANK!





X marks the spot—the spot where you'll find the solution to the case of the missing tank! It's a case that's baffled many heating dealers. They're mystified by PENN's ability to cut installation costs by completely eliminating the usual separate expansion tank.

Ingenious PENN engineers simply designed an air cushion *Tank Saver.* When filling the boiler, air is trapped in the space shown in the illustration above. This provides a reservoir or "air cushion" that takes care of the expansion and contraction of the water.

The PENN Tank Saver never becomes waterlogged . . . never requires bleeding. Shock absorption is quicker. Operation is fully automatic and satisfactory in every way.

There's a reward for dealers who solve the easy mystery of PENN's "missing" tank! It amounts to as much as $20 IN YOUR POCKET EVERY TIME YOU INSTALL A UNIT. All costs of the usual separate expansion tank installation are eliminated . . . you save not only the cost of the tank, but the cost of the piping, too. There's a "mystery" worth investigating!

PENN Packaged Heat
oil and gas fired units are manufactured in all capacities for residential installation.

Ontario Rep.
R. G. Dibble Co
Toronto, Can.

Canadian Distr.
(exclusive of Ontario)
Actrite Equipment Co.
Montreal

Export Office
80 Broad Street
New York 4, N. Y.

PENN BOILER and BURNER MFG. CORP.
LANCASTER PENNSYLVANIA

FOR VITALIZED HEAT
USE
Convector HUMIDIFIERS

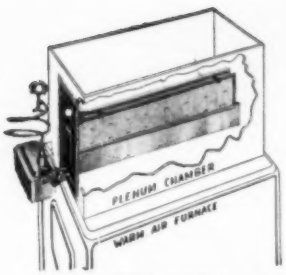
★ When you sell humidity, sell Maid-O'-Mist which gives your customers MORE humidity per $ cost!

★ One of the finest AUTOMATIC humidifiers available is this Maid-O'-Mist Convector . . . product of advanced engineering and precision manufacture—modern as tomorrow's newspaper.

★ *From the standpoints of price, satisfactory performance, ease of installation, and long service, it's miles ahead.*

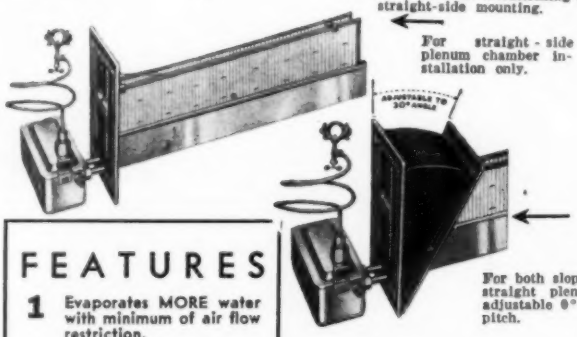
★ Learn the facts, and you'll be fully as enthusiastic as we are about the tremendous profit possibilities of this unique and entirely different product.

AUTOMATIC
FAST-ACTING
HIGHLY EFFICIENT
EASY TO INSTALL.
EASY TO SERVICE!



Showing proper installation of a 2-Trough "CONVECTOR" Humidifier on an Air Conditioning unit . . . straight-side mounting.

For straight-side plenum chamber installation only.



For both sloping and straight plenums — adjustable 0° to 30° pitch.

FEATURES

1. Evaporates MORE water with minimum of air flow restriction.
2. Water reservoir located away from heat of the furnace.
3. Non back-siphoning water feed valve fully approved by National Plumbing Laboratory.
4. Furnished complete with 6' of copper tubing, saddle valve, fittings, and installation instructions.

Come to HUMIDITY HEADQUARTERS

Maid-O'-Mist manufactures a complete line of humidifiers, humidifier valves and accessories. It pays to handle all of this high-grade, yet low-priced equipment. Write us, or see your jobber!

MAID-O'-MIST INC.

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

3213 N. PULASKI RD.
CHICAGO 41, ILLINOIS

PREMIER "SL"
WELDED and RIVETED
STEEL FURNACE

Seams Riveted and Welded Double Tight and Permanently Leak-Proof

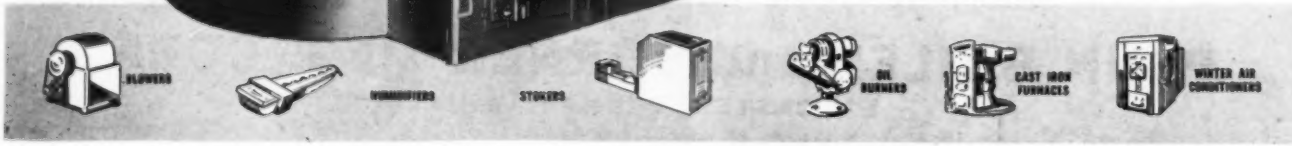
Roller Bearing Grates — Waist High Shaker

Specially Baffled Radiator, supported on Cast Iron Brackets

Double Sealed Connecting Collar — Permanently Leak-Proof

Guaranteed for Ten Years — Grates Insulated

PREMIER FURNACE COMPANY
DOWAGIAC, MICH.



"Quality before Quantity"
—an all-time Packard policy

PACKARD SUNLIGHT MOTORS

Quality of product has always been the first consideration at Packard. Manufacturers of leading appliances depend on this when they specify Packard Sunlight motors. They like the assurance that no "corners will be cut" to cheapen the motor —and jeopardize the reputation of their product.

PACKARD SUNLIGHT MOTORS for
compressors
washing machines
power-driven bench tools
ironers
milk separators
milking machines
furnace blowers
stokers
oil burners
water pumps
ventilators
and many other applications

Packard
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TRADE MARK

Packard Electric Division, General Motors Corporation, Warren, Ohio

ENDORSED APPLIANCE MOTORS FOR THIRTY-ONE YEARS

A Frank Statement
about the fuel situation...

There is much confusion in the public mind concerning the fuel situation. Many home owners do not know which way to turn. Many dealers hesitate to give them advice.

New installations of gas and oil heating equipment have already been limited in large areas. In addition, some present users of these fuels are not sure of *all* the fuel they will need this winter.

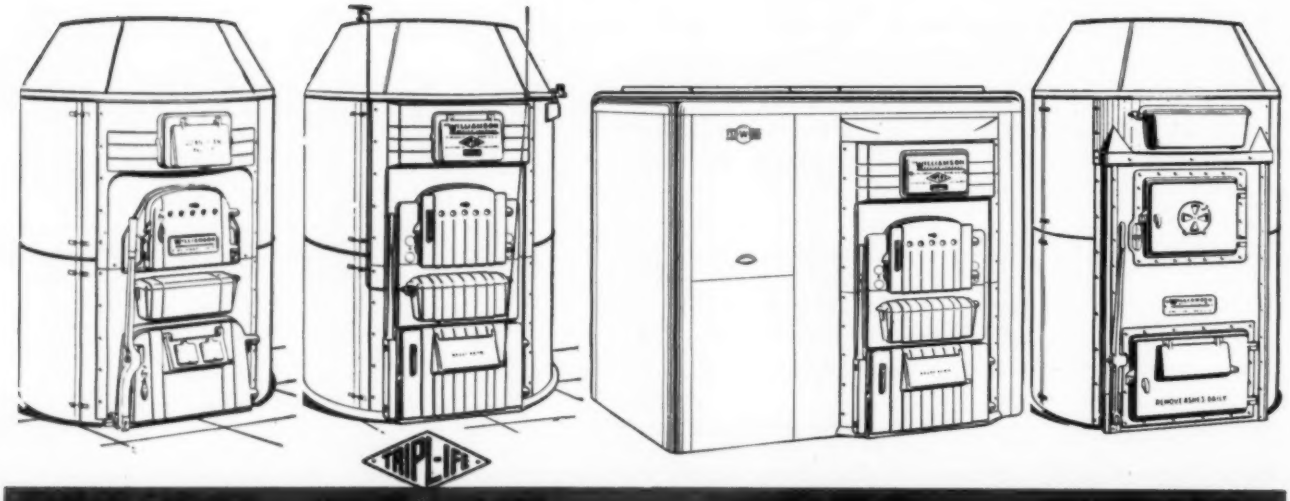
On the other hand, coal producers and distributors report that supplies of their fuel will be adequate this winter. From this, it is apparent that heating equipment installed now should be designed to burn coal as well as gas or oil.

Even if your customers are uncertain about the type of heating equipment they want, they *can be* sure of comfort this winter if they have you install NEW Williamson All-Fuel Furnaces. They will then be able to change to the type of fuel they want, when and if it is available and this change can be made in a few hours. The NEW Williamson All-Fuel Furnaces are designed to burn coal, oil, gas or coke at the highest possible efficiency. Laboratory tests and performance in the field prove that their efficiency is equal to and in many cases higher than that of units especially designed for and confined to the use of one fuel.

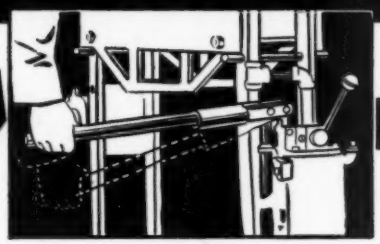
When you recommend the installation of a Williamson Tripl-ife All-Fuel Furnace, you can be sure that your customer will be satisfied . . . now and in the future!

WILLIAMSON
WARM AIR FURNACES

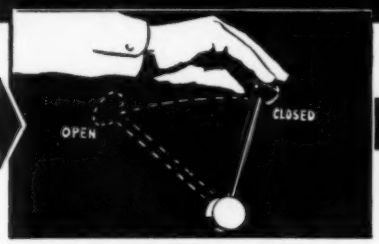
THE WILLIAMSON HEATER COMPANY
Cincinnati 9, Ohio



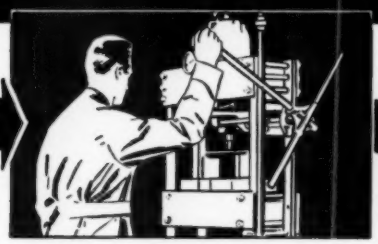
These KRW Hydraulic Arbor Press Features ...



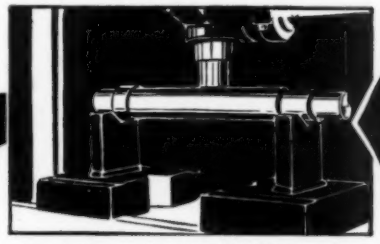
Fast Action, cylinder is filled as ram travels to work. You get tons of pressure with first pump stroke.



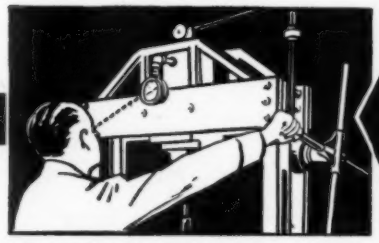
Finger Tip Control opens and closes valve in a jiffy. No gripping effort assures easier, faster operation.



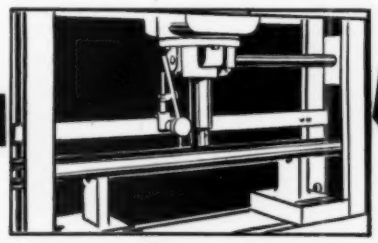
KRW Built-in Mechanical Press permits up to 3 tons pressure for straightening small diameter work.



One Piece, All Steel V-Blocks have machined surfaces for greater accuracy; usable upright or inverted.

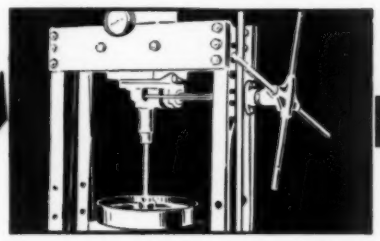


Highly Visible Pressure Gauges are mounted where they can be quickly checked. Read in tons and pounds.

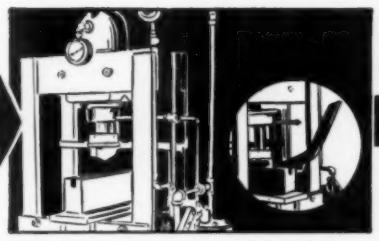


Micrometer Dial Attachment permits great accuracy in checking work without removing from V-block.

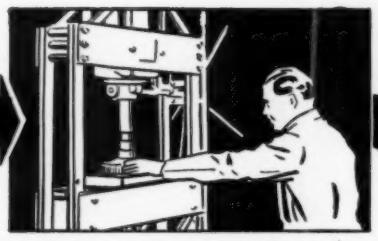
Reduce Costs ON THESE AND OTHER DAILY Production Jobs ...



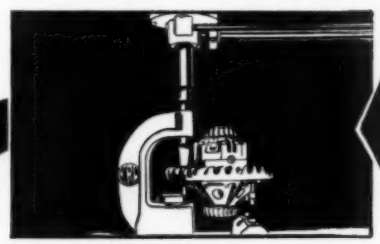
Broaching a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



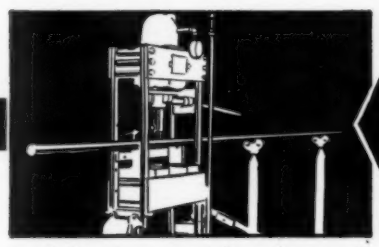
Bending in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



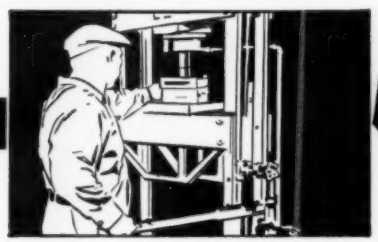
Pressing of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



Riveting with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



Straightening, especially on long work, is easy on a KRW Press because of its special open-end construction.



Blanking is easy with simple die set for short-run operations. Releases regular equipment for quantity production.

Write for the **NEW KRW** *Catalog .....*

K·R·WILSON

15 MAIN STREET, BUFFALO 3, N. Y.

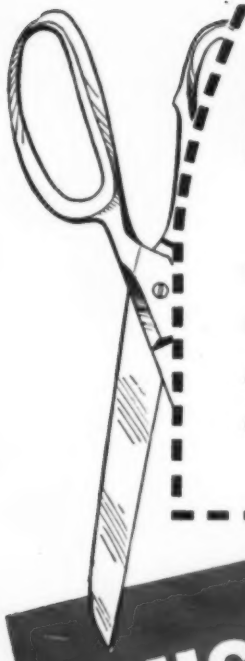
K. R. WILSON, 215-217 Main St., Buffalo 3, N. Y.

Please mail me a copy of your Hydraulic Arbor Press Catalog

Name .....

Address .....

City ..... ***Zone*** ..... ***State*** .....



Fraser Dept. F-D6, 11 West 42nd Street, New York 18, New York

TELL ME ABOUT THE FRASER FRANCHISE.

Name_____

Firm_____

Address_____

City_____ State_____

THIS COUPON is the next best thing to a blank check

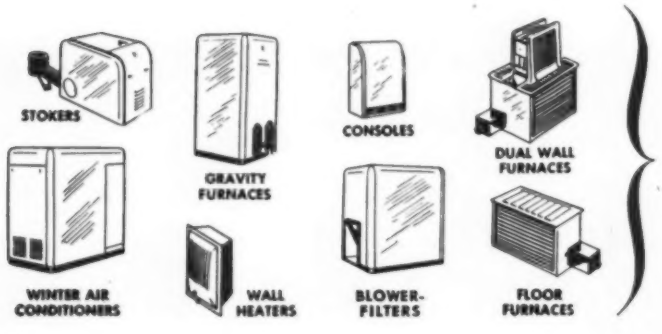
It may be your opportunity to get the famous Fraser Franchise!

This Franchise puts you on the receiving end of one of the most complete lines of home heating merchandise backed by a 25-year name of heating experience.

And only *you* can sell this line in your franchised territory.

Sales promotion and dealer aids, big carload discounts, a dealer financing plan, all these and more back up this big line that's priced for profit and volume.

We've a big story to tell and a real opportunity to offer eligible prospects. You owe it to yourself to investigate. Mail the coupon now!



Get yourself a

Fraser FRANCHISE

All gas appliances are approved by the American Gas Association. All electric appliances are approved by Underwriters Laboratories, Inc.

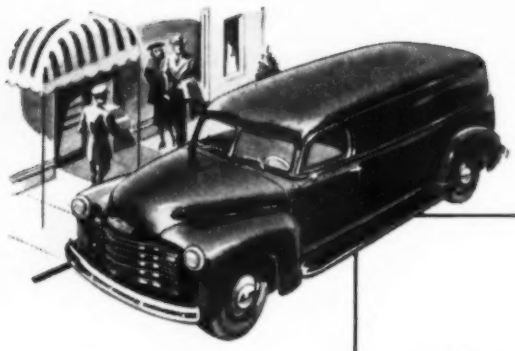
IF ALL OIL BURNERS WERE TIMKENS, THERE WOULD BE NO FUEL OIL SHORTAGE SCARE

Note: Timken Dealers are going to town on replacement sales. They *can* —because Timken Wall-Flame Oil Burners save one gallon of oil in every four used by ordinary oil burners.

TIMKEN
Silent Automatic
OIL HEAT

TIMKEN SILENT AUTOMATIC DIVISION
The Timken-Detroit Axle Company
JACKSON, MICHIGAN

The Accepted TIMKEN HEAT S|A Standard



Panels and pick-ups have **INCREASED LOAD SPACE**—stake and high rack bodies **MORE EFFICIENT LOADING.** . . . New stronger, sturdier **FRAMES** are designed to carry greater loads greater distances for a longer time!

THE CAB THAT "BREATHES"—fresh air is *drawn in* from the outside—heated in cold weather—and used air is *forced out!* It's roomier, much more comfortable, with 12 inches more foot room—eight inches more seating space!

CHEVROLET

Winning the Nation's Praise! . . .

Advance-Design

CHEVROLET TRUCKS

See the cab that "breathes"

You've *heard* about them . . . *talked* about them . . . and now they're here—ADVANCE-DESIGN trucks with the cab that "breathes"—that "inhales" fresh air and "exhales" used air!* Be sure to see this sensational new line of Chevrolet trucks with their scores of new features and innovations at your Chevrolet dealer's. **Fresh-air heating and ventilating system optional at extra cost.*

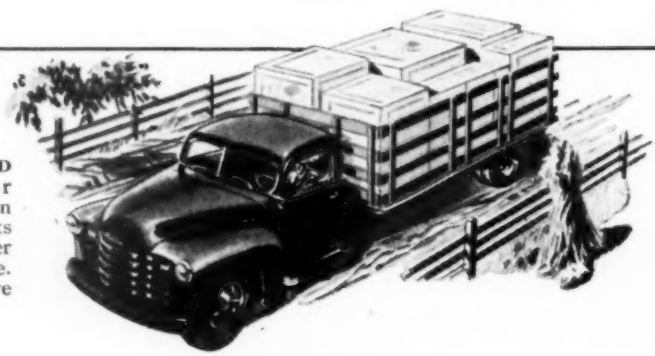
CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

Wider, deeper **WINDSHIELD** and **WINDOWS** increase visibility by 22%! New rear-corner windows, permitting even greater visibility are available as optional equipment at extra cost.

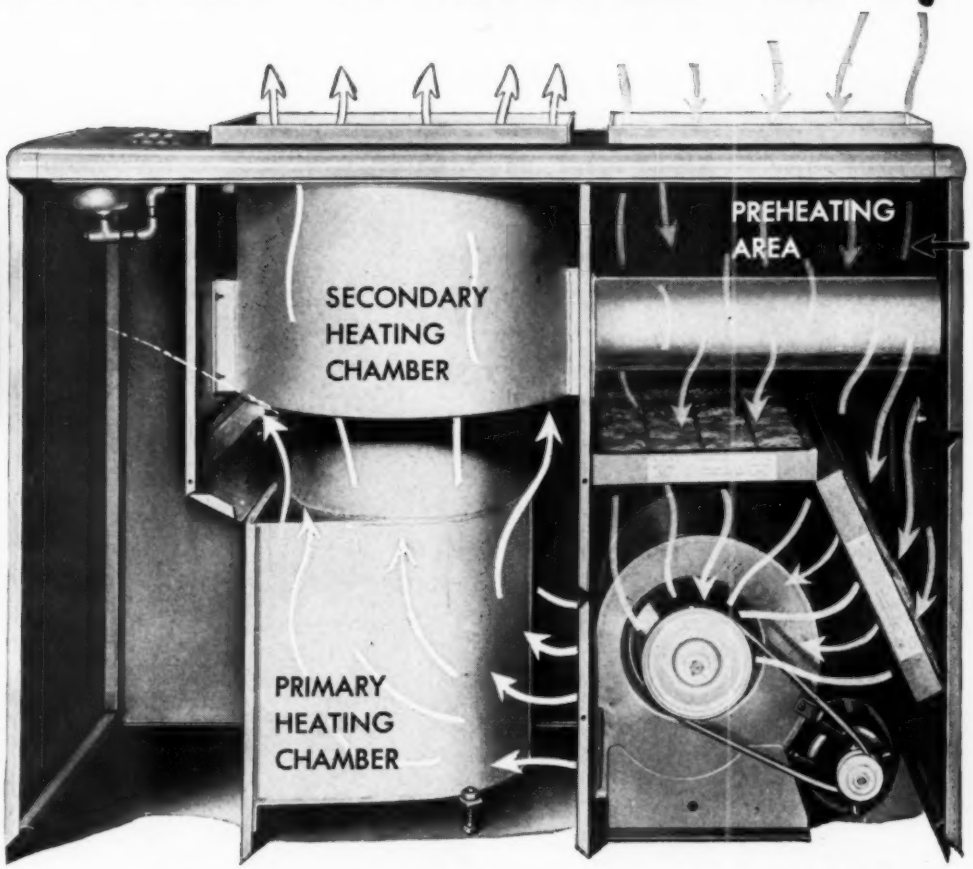
VALVE-IN-HEAD TRUCK ENGINES are world's most economical for their size. . . . Chevrolet's **HYDRAULIC TRUCK BRAKES** are *exclusively* designed for greater brake-lining contact and positive action!

The cab is **FLEXI-MOUNTED**—cushioned on rubber against road shocks, torsion and vibration! . . . The seats are fully adjustable, bigger and more comfortable. **LONGER WHEELBASES** give better load distribution.



Substantial – *is the word for it!*

The FITZGIBBONS DIRECTAIRE is built to last!



The Fitzgibbons Directaire works ideally with either the oil or gas burner of your choice. It filters the air to dust-free cleanliness, humidifies it healthfully and uniformly, warms it by the fuel-saving Fitzgibbons *Contra-Flow* system, and drives it by powerful, quiet, slow-speed blower to every discharge grille. The attractive jacket completely encloses most burners and all controls. Jacket panels are easily removed for servicing.

11-gage steel is tough stuff

When joined by the Fitzgibbons "Weldseal" process, which makes every joint actually stronger than the parts joined, you have a homogeneous unit which will endure physical shock and the inroads of time, with a life as long as that of the home it serves.

The Fitzgibbons Directaire is a winter warm air furnace conditioner that you can recommend with absolute assurance of its sustained leakproof qualities and exceptional sturdiness. All this in addition to its comfort-giving reliability and the outstanding fuel economy for which all Fitzgibbons equipment is famed.

Six sizes—65,000 to 200,000 B.t.u./hr.

Full data in the bulletin, on request.

MEMBER
NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
INDOOR COMFORT

MOST ECONOMICAL IN FUEL
1886
THE FITZGIBBONS BOILER

Reg. U.S. Pat. Off.

Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK 17, N. Y.

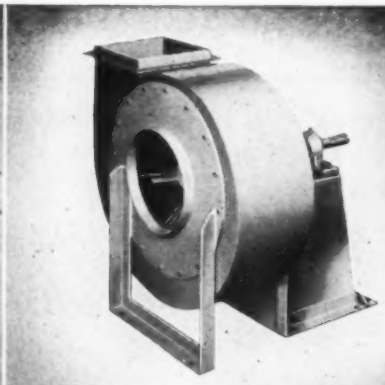
Manufactured at: OSWEGO, N. Y. *Sales Branches in Principal Cities*

FITZGIBBONS DIRECTAIRE

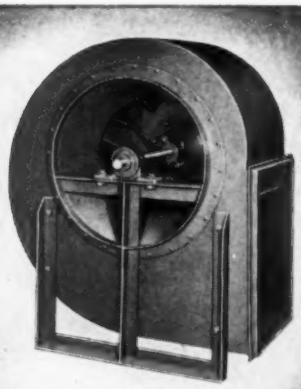
The warm air conditioner that meets all conditions

Engineering Integrity in the Construction and Application of BLOWERS, FANS *and* EXHAUSTERS

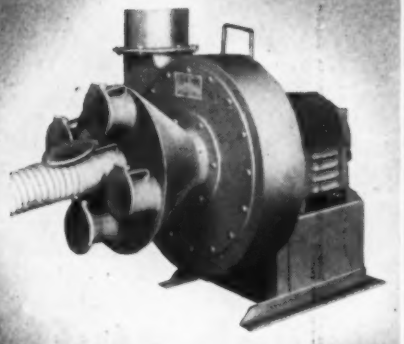
CENTRIFUGAL BLOWERS



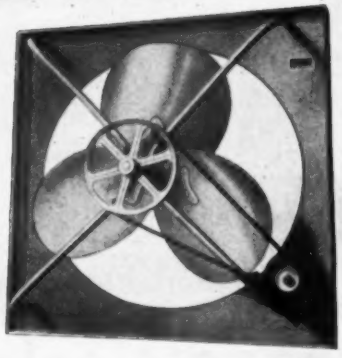
STEEL PLATE EXHAUSTERS



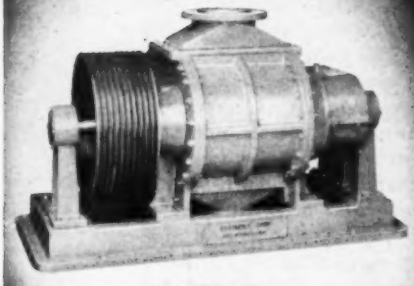
MULTIBLADE EXHAUSTERS



WELDING FUME EXHAUSTERS



EXHAUST FANS



ROTARY POSITIVE BLOWERS

"LUNGS FOR INDUSTRY"

More than 20 years' experience in the construction of Blowers, Fans, and Exhausters for leaders in Industry have qualified us to recommend a unit to fit your requirements, whether it is for Blowing, Heating, Cooling, Conveying, Aerating, Separating or Agitating.

Engineering skill and integrity in the supplying of Turbo and Rotary Positive Types of Blowers, Exhausters and Boosters enables us to furnish you with the type of equipment best suited to your particular need, whether "standard" or "custom built."

ENGINEERS — EXECUTIVES

Write for our new, illustrated Products Bulletin, "LUNGS FOR INDUSTRY." Address:

GB
"LUNGS FOR INDUSTRY"

GENERAL BLOWER CO.

8607 FERRIS AVE.
MORTON GROVE 2, ILL.

ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

MORE SALES PLUS GREATER CUSTOMER SATISFACTION
FOR MANUFACTURERS WHO USE
BREESE
HORIZONTAL BURNERS as
Original Equipment
AVAILABLE in 1 gallon and ⅔ gallon per hour CAPACITIES

Actual photographs of five of the many nationally-known units using the BREESE HORIZONTAL BURNER as original equipment.

Manually controlled models also available for ranges and similar applications.

MORE AND MORE HEATING PLANT MANUFACTURERS ARE ADOPTING THE BREESE HORIZONTAL BURNER AS ORIGINAL EQUIPMENT. IT OFFERS

PROPER CAPACITY FOR MAXIMUM EFFICIENCY. The capacity sizes of the BREESE HORIZONTAL BURNER (⅔ gal. per hr. for 60-70,000 BTU/hr. output; 1.0 gal. per hr. for 100-110,000 BTU/hr. output) permits manufacture of smaller, low-cost heating plants in the proper size to meet today's heating demands. Over-firing and resulting waste of money is avoided.

LOW-COST, TROUBLE-FREE OPERATION. Simplicity in design and the highly efficient firing rate assure continual service with exceptional operating economies.

READILY ADAPTABLE TO PRESENT DESIGNS. The burner is easily attached on the outside of the unit and will fire into many sizes and shapes of combustion chambers.

DISTRIBUTORS AND DEALERS . . . USE FOR CONVERSION INSTALLATIONS: The Horizontal Burner is excellent for conversion purposes because of its flexibility and ease of installation. Save money for your customers with this burner of *proper* capacity for maximum efficiency.

Write today for descriptive literature and technical data. Our Engineering Service is available on all BREESE BURNER applications. DISTRIBUTORS AND DEALERS write also for names of manufacturers supplying equipment using the BREESE HORIZONTAL BURNER.

BREESE BURNERS, inc.

FORMERLY OIL DEVICES

341 EAST OHIO STREET CHICAGO 11, ILL.

RESEARCH AND ENGINEERING
SANTA FE, NEW MEXICO

GREATER *Sales* AND *Profits*

THROUGH FULL REPRESENTATION IN THIS QUALITY LINE OF

WARM AIR HEATING EQUIPMENT

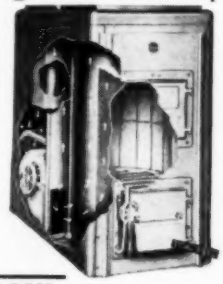
Certified

ORDER THESE UNITS *NOW!*

COUNTERFLOW

GAS, OIL, & COAL FORCED AIR UNITS

A compact, double bodied, forced air heating unit designed to provide greater fire travel over increased heat absorbing surfaces. Completely enclosed in attractive enameled casing are combustion chamber, heat saver, blower, motor, filter, humidifier, controls and burner. An ideal winter Air Conditioning Unit for home or building installation.



PERMAWELD CONSTRUCTION, applied to all CERTIFIED FURNACES means an all steel body, electric arc-welded into one complete and durable unit. Through Permaweld construction gas leakage is overcome and installations made simpler.

WATCH OUR ADS FOR ANNOUNCEMENT OF NEW UNIT COMING SOON!

R-G GRAVITY FURNACE

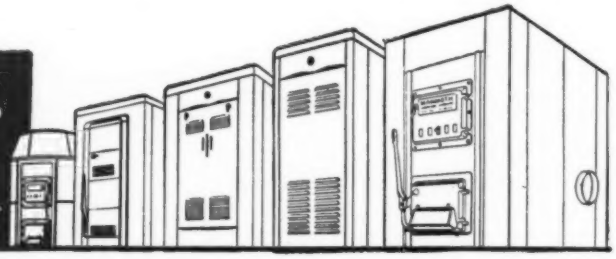
Certified's all steel round gravity type furnaces are now available for immediate shipment. This popular model is built in sizes from 22 in. to 36 in. For full details on this R-G model, write for Bulletin 1144-C.

SEE YOUR JOBBER FOR COMPLETE DETAILS ON CERTIFIED EQUIPMENT

CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE. ST. PAUL 4, MINN.



THERE'S *only* ONE...

WORLD KNOWN

QUIET AUTOMATIC
OIL BURNER

THE BURNER WITH BUILT-IN QUIETNESS and EFFICIENCY!

View Showing Transformer on Top

MADE IN 6 SIZES — 1 to 20 gallons per hour — A Size to Fit the Furnace

IT'S TRIED, TESTED AND APPROVED by thousands of users all over the world, and by hundreds of dealers and distributors who proved to themselves that QUALITY ALWAYS PAYS. Now, they buy in quantity because of our Exclusive Dealership Plan. Wire or write us today regarding your territory!

QUIET AUTOMATIC BURNER Corp.

Manufacturers & Engineers

49 BLOOMFIELD AVE.

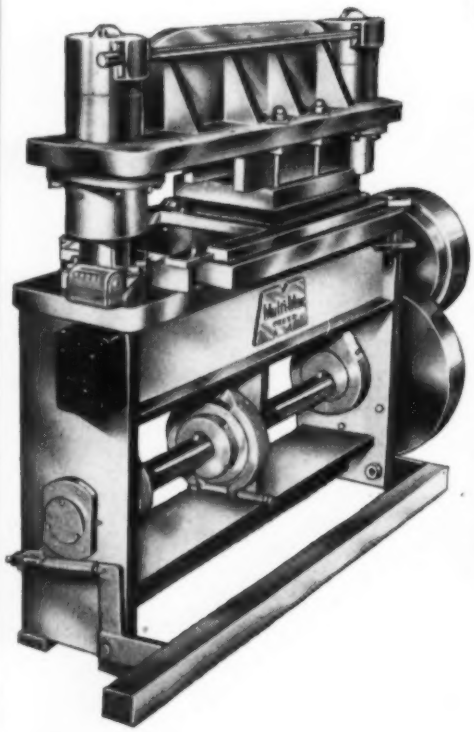
NEWARK 4, N. J.

FACTORIES AT BLOOMFIELD and MONTCLAIR (Newark Suburbs)

OTHER PRODUCTS MADE BY US ARE:

Arkay Oil Furnaces	Winter Air Conditioning Furnaces	275-Gallon Oil Tanks	Roos Wire Die Machinery for Steel & Copper Mills	Tankoils and Tank Equipment

THE NEW 30-TON MECHANICAL **Multi-Max** PRESS



Shears, blanks, notches, punches, slots, perforates, bends and forms sheet metal parts *in single and multiple units!*

THE MULTI-MAX is the most versatile press ever built. It can be used as a straight cutoff shear, as a combination shear and piercer, or as a shear and notcher for single or multiple units with one operation and one operator. It will blank out flat metal parts in many unusual patterns. It will punch, perforate, pierce, lance and slot. It will bend and form in sizes up to 18" x 30", 22 gauge with ⅞" flange. The MULTI-MAX can be put to many ingenious uses for short or long production runs, subject only to its capacity and range sizes.

It requires no foundation, has no overhanging parts. Because of its small compact size (36" x 75") it may be picked up and moved in and out of the production line as needed. The MULTI-MAX has a "plug-in" advantage and unlike any other press in existence, it may be taken to the work rather than depending upon the work being brought to it. Finished parts may be fabricated right at the point of assembly in required amounts, thus saving long runs, large inventories, handling and stacking costs, and release valuable storage space for more productive use.

SPECIFICATIONS:

Capacity	30 tons
Stroke	2"
Ram Adjustment	2"
Shut Height (Stroke down, adj. up)	10"
Strokes per minute	100
Bed—Die Space	12" x 36"
Ram—Die Space	10" x 36"
Bed Opening	5" x 32"
Main Shaft Bearings (Heavy Duty Bronze)	3
Back Shaft Bearings (Fafnir, Straddle Mounted)	2
Guide Bearings (Sealed)	4" dia. x 5" long
Motor Furnished	1½ HP, 3 phase
Height of bed from floor	32"
Overall Height	57"
Floor Space Required	36" x 75"
Shipping Weight (Approx.)	3250 lbs.

For complete information and prices write

PARKER MANUFACTURING COMPANY

Manufacturers of Parker 10 and 14 ga. Power Squaring Shears.

2200 Colorado Avenue — Santa Monica, Calif.

Extra Profits In Blower Installations

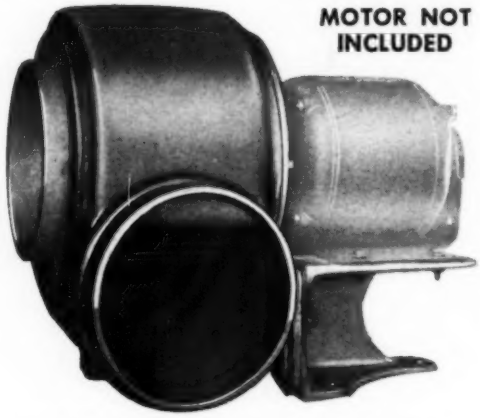
with

Vent-Air

General Purpose

CAST ALUMINUM

UTILITY BLOWERS



MOTOR NOT INCLUDED

6" (less motor) - - -	$19.00 Net
7" (less motor) - - -	24.00 Net
9" (less motor) - - -	36.00 Net

Blowers are of light weight, sturdy, cast aluminum —non-sparking. Standard diameter inlet and outlet—fit stock size pipe. Adjustable base—fits any standard motor. Adjustable discharge—rotates to four positions. Wheel statically and dynamically balanced.

Installed with used or new motors—VENT-AIR provides a compact, efficient blower set that permits you to make a good profit for your time and trouble. Order a VENT-AIR today. Send purchase order or cash. Shipped F.O.B. Detroit.

Fried Air-Kool Co.

2930 GRAND RIVER
DETROIT 1, MICH.

MR.

FURNACE MANUFACTURER:

Consider Building
YOUR OWN BLOWER ASSEMBLIES

AND HERE'S WHY IT WILL PAY YOU . . .

1. You increase sales volume by expanding into a new and growing market with a new product.

2. You manufacture more of your present product in your own shop, and so retain the profit on manufacture—and also cash in on any unused production facilities.

FOR YOUR BLOWER MANUFACTURING MORRISON OFFERS YOU

1. Morrison Airstream 3 piece spot welded Blower Wheels—the wheels that are standard equipment in the heating, ventilating and air conditioning industry.

2. Complete engineering service, shop drawings and templates.

3. Cost analysis on building complete blower assemblies.

Send for Morrison data, graphs and charts . . . valuable and no charge.

MORRISON

MORRISON Airstream

PATENTED

Blower Wheels

MORRISON PRODUCTS INC.
East 168th & Waterloo Rd. - Cleveland 10, Ohio

Please mail me copies of Morrison Bulletins:

- ☐ 403 Morrison Airstream Blower Wheels
- ☐ 303 Morrison Airstream Engineering Service

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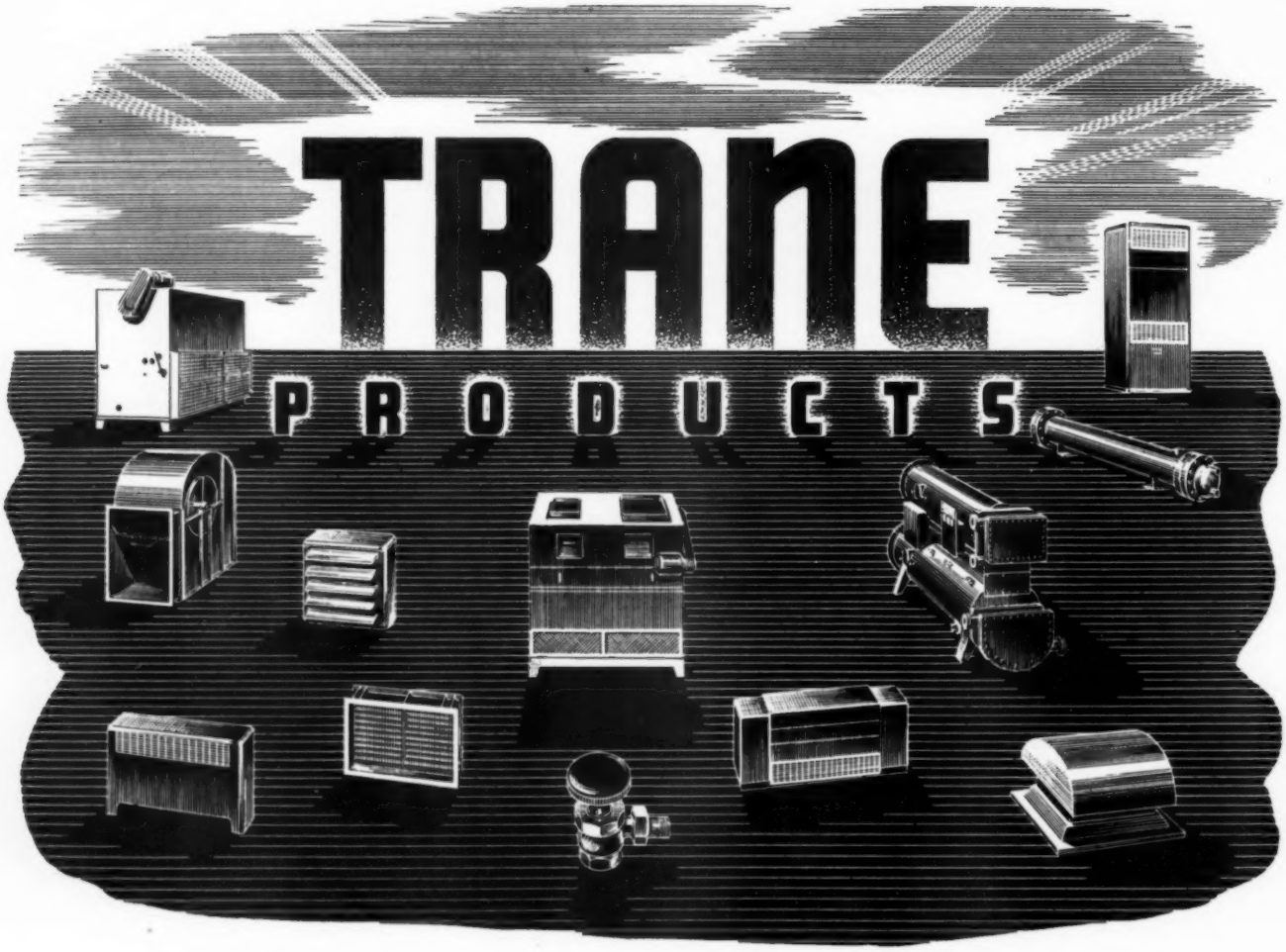


Job After Job Calls for Heating *and* Cooling . . .
GET THE CONTRACT FOR *Both*...WITH TRANE PRODUCTS

Job after job now calls for both heating and cooling. Since the functions are so closely allied, often being accomplished with much of the same equipment, heating and air conditioning *must* be considered together.

Architects, engineers, and owners prefer a minimum of contracts and responsibilities — so the contractor who can bid on the whole job has a much greater chance of getting it. The contractor who cannot bid on the whole job may likely lose it to one who can.

Heating and air conditioning are so closely related, from figuring the job through installing it, that it is only logical for the contractor to grow with the industry by combining heating and air conditioning. In this way, the contractor has peak business the year around, and is assured of a steadily increasing market in remodeling and modernization work, as well as in new construction. Just as the contractor needs both heating and air conditioning to make his service complete, the heating and air conditioning industries need additional contractors so that they can expand to meet the enormous demand.

Trane is the ideal source of supply for the independent contractor who combines heating and air conditioning. The complete Trane line includes every necessary product for entire heating and air conditioning systems — giving the contractor the undivided responsibility of *one* manufacturer. Trane field engineers in 85 field offices are constantly available for help and advice in any phase of heating and air conditioning.

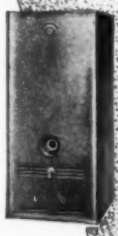
TRANE

Manufacturing Engineers of Equipment for
HEATING AND AIR CONDITIONING

THE TRANE COMPANY, LA CROSSE, WISCONSIN • Also TRANE COMPANY OF CANADA, LTD., TORONTO, ONTARIO

Your Sales Instincts will Tingle and Your Pockets will Jingle

if you take advantage of the hottest selling story in the heating industry today. It's the story of Superfex "Round the Clock" heating . . . the only one of its kind.



✔ *Check these features*

1. Exclusive "Homogen-Air" system. Has three-stage, non-stop fire, automatic variable speed blower.
2. Two furnaces in one . . .
   A. Peak (high fire) capacity for the coldest weather demand.
   B. Automatic cut-back to economical low fire operation and low blower speed for that "in between" mild weather.
3. Healthful "live air" action.
4. Avoids layer cake separation of heat, which means . . .
   A. Uniform temperature, floor to ceiling, all rooms.
   B. Warm floors. No "Cold leg zone".
   C. All-over comfort.
5. Gas or oil-fired models. (Designed for it . . . not conversion burners.)
6. Proved fuel economy.
7. Summer Fanning and Filtering facilities.
8. Heavy, long-life construction throughout.
9. Scratch and chip-proof finish. (Bonderized steel grips attractive baked enamel.)
10. A size and style for every type of home.
11. Companion line of "Thermaflow" non-blower models also with three-stage fire.
12. Special units for popular basementless type homes.
13. Wide consumer acceptance based on long successful performance.

Then Add...

A profit-protected exclusive franchise.*

Sound national advertising support.

Effective Dealer Help materials.

Quality and performance leadership insured by the finest development laboratory ever owned by a heating manufacturer.

Unreserved backing of the big name company with 60 years of history and a sure future.

*** Yes, there may still be one of these franchises available in a spot where you'd like to do business. All YOU need is Determination, Dependability, a bit of DO. Then check with the home office without delay.**

Superfex FURNACES

GAS OR OIL

PERFECTION STOVE COMPANY

7919-C Platt Avenue • • • • Cleveland 4, Ohio

FISHER *Quality Commercial* FIXTURES

FOR BARS • FOUNTAINS • RESTAURANTS • CAFETERIAS

Beauty Durability Simplicity

FISHER has designed and engineered many new features into fixtures for the commercial field. All are improvements to meet the strict requirements of the trade for beauty, durability, safety and easy installation. Many excess parts have been eliminated and construction simplified. Corners and sharp edges are eliminated wherever possible. A true quality line at lowest cost.

200 L Swing Spout Faucet
Indexed handles, renewable seats . . . Simple construction makes this swing spout a sales value unparalleled. Cast brass, polished chrome finish.

202 F Glass Filler Faucet
Simplified water flow ducts . . . . with excess parts eliminated. . . . Short, easy valve action. Longer lasting rubber bumpers.

203 This is the same mechanism as 202 F. but comes in combination for use vertical or horizontal.

299 Glass Filler Station
Another combination with the simplified mechanism of the Fisher Glass Filler. The Drip pan is Permite, acid resisting, lighter than aluminum. Has highly polished lustre.

306-306 C Sink waste socket and standpipe is precision machined to insure leak-proof fit. Finished in plain brass or polished chrome.

309-314-317 Handles
All handles are cast brass with polished chrome finish. Strong, beautifully designed. 309 is an offset handle. 314 a refrigerator drawer pull, and 317 a multiple-use fixture handle.

301 Adjustable fixture legs. This beautifully designed, highly polished fixture leg allows 5/8" adjustment with minimum length of 6". Comes in polished chrome cadmium plate or rough brass. A perfect addition to any floor resting fixture.

312-313 Towel bar and towel rings. Designed to withstand rough usage. In polished chrome.

318 Bell Shaped Foot for use with adjustable leg Styling for practical fixtures of simplified design.

315 Two-way Draft Arm Station to standard measurements — all visible parts polished chrome.

ALSO SINK STOPPERS — DIPPER WELL OUTLETS — SINK WASTE SOCKETS — OVERFLOW BUSHINGS — TANK FLANGES — POT HOOKS — GOOSENECK RISERS — MONITOR BURNERS — AND OTHER ITEMS.

AVAILABLE FOR IMMEDIATE DELIVERY
WRITE TODAY FOR NEW FISHER CATALOG

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Cincinnati 2, Ohio

IN CANADA: GENERAL STORE FIXTURE CO., 575 Queen St. W. Toronto 2

NOTE: Some new territories are now available for manufacturers' Agents. Wire or write to Sales Department—

FISHER BRASS FOUNDRY

5332 SO. SANTA FE AVE. • LOS ANGELES, CALIFORNIA

Contact us Now about this Remarkable New

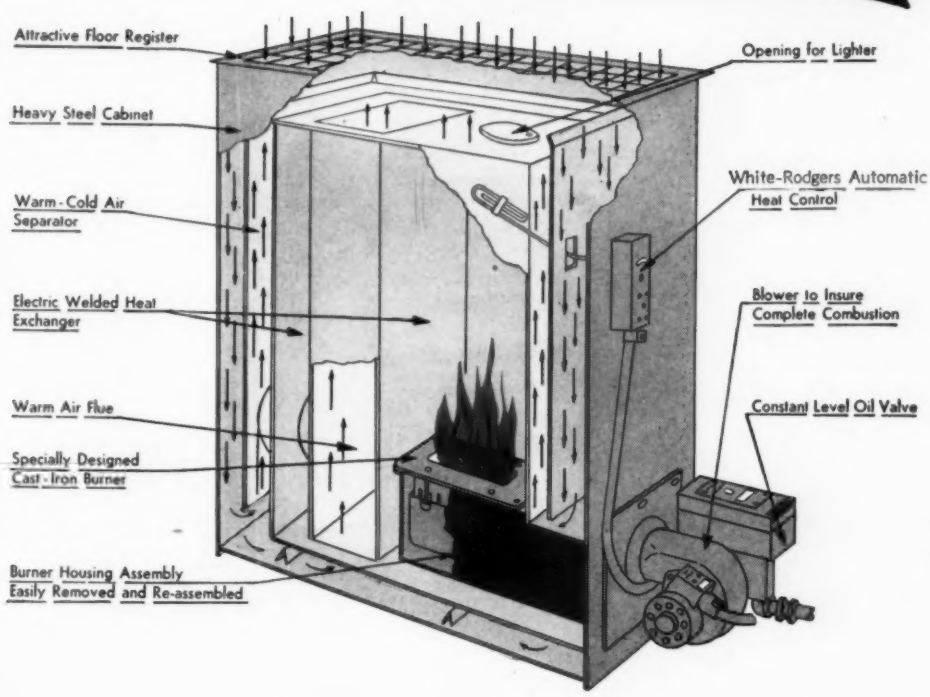
ROBERTS *Automatic Oil* FLOOR FURNACE

APPROVED BY UNDERWRITERS' LABORATORIES INC.

14" WIDTH ELIMINATES CUTTING OF FLOOR JOISTS AND WEAKENING FLOORS

HEATS UP TO FIVE ROOMS

INSTALLED BY TWO MEN IN FOUR HOURS



The outstanding furnace achievement of the year . . . . Exceptional in appearance and performance . . . . Designed and APPROVED FOR COMPLETE AUTOMATIC TEMPERATURE CONTROL . . . . Shipped as a complete unit . . . . Automatic thermostatic controls standard equipment. Model #AK-101, 52,000 BTU . . . Width 14", Length 30", Depth 35". Flue Pipe 6" diameter . . . Draft required, .05" water column . . . Heat Exchanger 16 ga. . . . Grill, oak finish . . . . Casing and Air Separator 24 ga. . . . Shipping Weight 165#. Draft Booster Blower . . . . Oil No. 3 OR BETTER.

A Limited Number of Dealer Franchises Available

ROBERTS FURNACE

DIVISION OF BONE TOOL & GAUGE COMPANY

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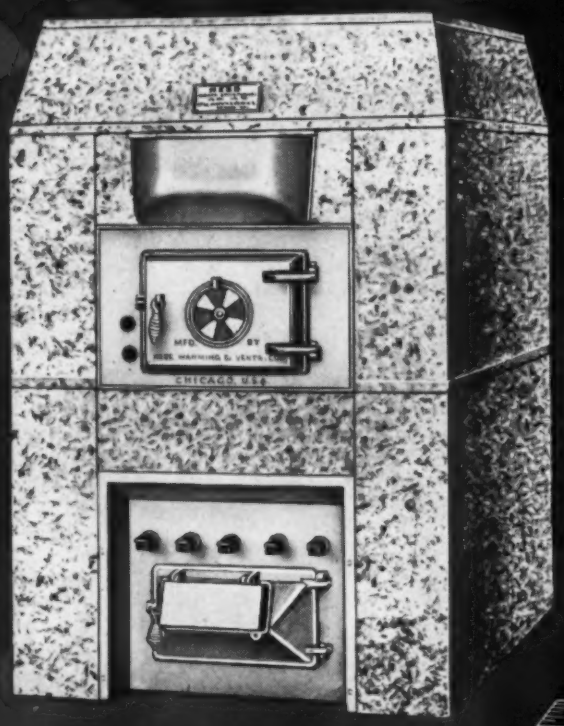
HESS

A Famous Name in Home Heating Since 1873



On the Square **RADIANT HEATING**

NEWSPAPER!

MAGAZINE!

DIRECT MAIL!

RADIO!

ADVERTISING

will bring greater profits to HESS Dealers

HESS WARMING & VENTILATING CO.
1211 So. Western Ave.
Chicago 8, Ill. Dept. C

Yes- Send me complete details on the HESS WELDED STEEL FURNACE.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

HESS Since 1873

WARMING & VENTILATING CO.

1211 So. Western Ave., Chicago 8, Ill.

NEW LITERATURE

Use the Coupon on Page 128

236—Sterilator

A four-page folder tells the advantages of the Sterilator (equipped with G-E germicidal lamps), designed to be installed in the duct system to reduce the bacteria count and deodorize.—*Domestic Devices, 1495 Warrensville Center Road, Cleveland*

237—Air-Flo Catalog 42-C

Catalog 42-C contains information about the Air-Flo line of automatic shutters, automatic ceiling shutters, automatic back draft dampers, manually operated shutters and motor operated shutters.—*Air Conditioning Products Company, 2340 W. Lafayette, Detroit 16.*

238—Luxaire Oil

A well-illustrated folder describing Series O Luxaire automatic oid-fired winter air conditioners has been issued by the manufacturer. Included in features of the Luxaire unit are a submerged-arc welded steel combustion chamber, a tubular radiator, and a die-formed cabinet with a hinged door. Interior and exterior of cabinet are finished in baked enamel. The fire box is pre-cast refractory brick—*The C. A. Olsen Manufacturing Company, Elyria, Ohio.*

239—Furnace Repair Parts

Complete stocks of furnace repair parts are listed in an 88-page catalog dated August, 1947. Serving the industry for the past 75 years, the corporation has accumulated some four hundred thousand repair patterns. In addition, furnaces, blowers, pipe, fittings, registers, controls, tinner's snips, asbestos paper, furnace cement, paint and other supplies are available.—*Northwestern Stove Repair Co., 662 W. Roosevelt Road, Chicago 7.*

240—Sheet Metal Mathematics

Simplified Sheet Metal Mathematics—New York State Vocational and Practical Arts Association—contains 264 pages, 7¾ x 10¼ inches—spirally bound. Price $2.75.

Mathematical principles and concepts related to sheet metal work were selected from the general fields of arithmetic, algebra, plane geometry and trigonometry and were applied in this text and work book. The mathematical areas covered include linear, angular, area and volume measure; common and decimal fractions; formulas; equations; proportion, trigonometry and graphs.

The text is illustrated with typical sheet metal pattern and layout drawings and contains problem material to insure the mastery of each new topic. Formulas and tables required are included for reference purposes.

The book is adaptable for use by apprentices, craftsmen, training supervisors, teachers, and for home study.—*Delmar Publishers, Orange Street and Broadway, Albany 7, N. Y.*

OVER 1,000,000 HOMES NOW ENJOY

VENTALARM®

CONVENIENCE and SAFETY

It's a fact that in more than a million oil-heated homes, VENTALARM now insures convenient, economical, more efficient fuel-oil delivery service.

(VENTALARM, of course, is the audible Tank Fill Signal for cellar oil storage tanks that makes any oil-burner installation *completely* automatic.)

VENTALARM signal gives instant, positive warning when the tank is filled — insures that all the fuel goes *into the tank,* without overflow or spillage.

Home owners appreciate, too, VENTALARM guarantee of freedom from interruption when the oil man calls. No need to wait around for oil delivery — with VENTALARM, the driver need never enter the home.

Quickly, inexpensively installed on new tanks and existing installations. Complete details and special customer mailing folders are available upon request. Purchase it from your supply house.

VENTALARM
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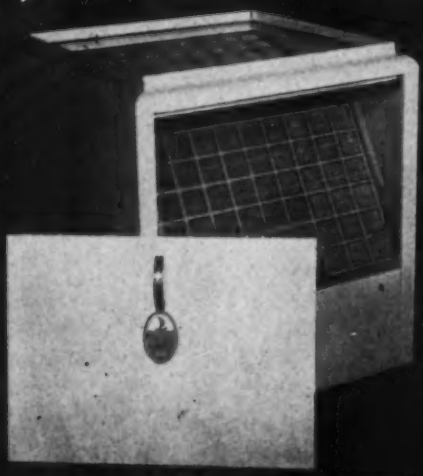
Whistling TANK FILL SIGNAL

Canadian Licensee EMPIRE BRASS MFG. CO., LTD London, Ontario.

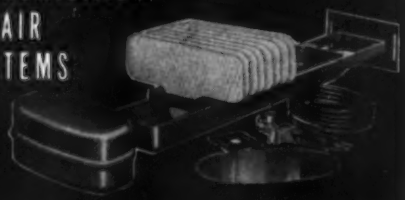
Be A Blower Dealer



Convert any gravity furnace into a modern forced-air heating plant with the Viking Blower Package. Engineered for quick, easy installation . . . quick, certain profits for you.

ANOTHER Viking PROFIT BUILDER

SERIES 1100 HUMIDIFIER FOR FORCED AIR HEATING SYSTEMS



A companion package that makes your conversion job a complete WINTER AIR CONDITIONING SYSTEM. Designed to fit all types of furnaces. Complete data in Bulletin 349.

Viking No. 11 KIT

AUTOMATIC WATER PAN FILLER FOR USE ON ANY FURNACE

A complete package. Carry one at all times. Quickly, easily installed. Helps make an inspection trip a profitable call.

Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

NEW LITERATURE

Use the Coupon on this page

241—Leigh Building Products

A 12-page catalog (47-L) showing Leigh ornamental shutters, dust chutes, clothes chute doors, brick and foundation ventilators, attic and roof ventilators, built-in mail boxes, and milk and package receivers is available, styled and built by *Air Control Products, Inc., Coopersville, Mich.*

242—Series P Moncrief

A new 6-page folder illustrating and describing mechanical details of the Moncrief oil-fired automatic air conditioning unit, Series P, is being distributed. Included are photographs and description of a new automatic submerged arc welding machine used in constructing Moncrief furnaces.—*The Henry Furnace Company, Medina, Ohio*

243—Control Display Kit

A display kit to help jobbers and dealers bring Field barometric draft controls to the attention of consumers is offered at the regular price of the controls. The actual controls are shown in operating position. Full sales information is in readable type on the back of the display.—*Field Control Division of H. D. Conkey & Company, Mendota, Ill.*

244—Winter Air Conditioning

A four-page folder pictures and describes the oil and gas-fired automatic winter air conditioning units—Series OL and GA. Appearance, performance, dependability and economy, as well as features are covered. The line includes conditioners and furnaces beginning at 52,500 Btu capacity.—*Jackson & Church Company, Saginaw, Mich.*

245—Beckett Commodore Oil Burners

Five new specification sheets give complete specifications and mechanical description of the Series OB, M, ME, L and LE Beckett Commodore oil burners. Each sheet illustrates the burner described. These sheets are intended for use with sales letters to prospects, as catalog pages and as proposal enclosures by distributors, jobbers, dealers and salesmen.—*R. W. Beckett Corporation, Elyria, Ohio.*

American Artisan,
6 N. Michigan Ave.,
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

145	146	147	148	149	150	151	152
153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	
236	237	238	239	240	241	242	243
244	245						

Name .....

Company .....

Address .....

Are you manufacturer? ☐ Jobber? ☐ Dealer? ☐

WITH THE CONTRACTORS

Elmer Hamill is conducting business in Blythe, California, as the Blythe Sheet Metal Works.

Frank Guzman Barrios is conducting business under the firm name of Paramount Heating and Air Conditioning Company at 921½ Hilton Court, Los Angeles.

Robert L. Smith and Linton H. Norman are conducting business at 16,018 South Western Avenue, Gardena, California, as the Gardena Sheet Metal Works.

Harry Tapin has been issued a building permit for the construction of a sheet metal shop at 4416 West Jefferson Blvd., Los Angeles—a concrete block structure 50 x 88 feet, to cost $15,000.

J. F. Shelton Co., 200 Poplar Avenue, Memphis, Tennessee, long active in the sheet metal trade has added an air conditioning department for homes, offices and other structures.

John W. Kaelin plans to build a new sheet metal shop at Ohio Street and Third Avenue, Evansville, Indiana. The building will be 40 x 80 feet, of concrete block structure and valued at $5,000.

William C. Slater, formerly with Chicago Heights Furnace Supply Company, 102 East 22nd Street, Chicago Heights, Illinois, is now operating as the Slater Metal Products, Inc., 17641 Ashland Avenue, Homewood, Illinois.

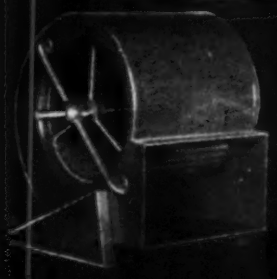
Hubert Bennett, formerly Bennett Sheet Metal Works, and Burl Bennett head the McMinnville Sheet Metal Works housed in a brick structure on Morford Street, and featuring furnace work, roofing, air conditioning, blow pipe, skylights, and ventilator work.

Frigid Cold, Inc., with a capital of $75,000, has been recorded in Los Angeles County to manufacture and sell air conditioning, heating, ventilating and refrigeration. Directors are Carl W. Faucett, Ellen Hull and N. I. Rose, all of Los Angeles. The corporation is represented by Carl W. Faucett, 650 South Grand Avenue, Los Angeles.

J. D. Kirkpatrick, president, announces that Joe D. Miller has been named manager of the Royal Air Conditioning Co., 607 Rusk, Houston, Texas. Mr. Miller has been a resident of Houston for 32 years. He has been sales manager of the C. I. T. Corporation, and for 17 years prior was assistant national advertising manager of the Houston Chronicle.

MANUFACTURERS!

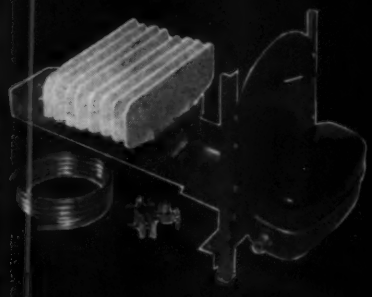
Viking EFFICIENCY



Puts Quality in Your Furnace

Viking Blower assemblies are recognized by the entire industry as the most efficient, trouble-free unit ever developed. And, the complete unit costs less than one you, as a furnace manufacturer could build or assemble yourself.

Viking Dependable Humidifiers Add Winter Air Conditioning to Your Furnace



SERIES 1300 FOR POPULAR SIZED FURNACES

A complete float operated humidifier especially designed for small plenum installations. Incorporates the famous Viking Top Seat float valve for longer, trouble-free service under all conditions. Bulletin 349 contains complete data.

Write Today for Viking BLOWER CATALOG

Contains complete specifications on blower units for any size furnace at any capacity.

Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

THERE'S A
Draft-O-Stat
FOR EVERY REQUIREMENT

MODEL "B" DOMESTIC
—new design

The new Model "B" Draft-O-Stat represents the latest achievement in precision combustion control for the small heating plant. Adjustable counter-weighted flutter controls draft barometrically, saving fuel, reducing smoke and soot, and improving furnace operation. Two sizes, to fit flue pipes from 6" to 9".

MODEL "A" DOMESTIC

The original Draft-O-Stat for automatic control of chimney draft in furnaces and boilers. Adjustable counterweight provides precision control of draft. Available with or without thimble. Nine sizes, 7" to 20".

COMMERCIAL

For use in apartment buildings, hotels, schools, small factory and office buildings. Can be used on natural-draft or motor-driven oil burners, hand-fired boilers, stokers, and forced-draft installations. Available with or without hand control. Four sizes, 16", 18", 20" and 24".

INDUSTRIAL

Sturdily built heavy-duty draft control for large heating plants. Available with or without breeching plate and thimble, and with or without locking device. Like other Draft-O-Stats, it pays for itself in most cases, out of one year's fuel savings. Three sizes —24", 30" and 36".

A 48 page Draft-O-Stat Manual, giving the complete story on barometric draft control, is yours for the asking.

THE HOTSTREAM HEATER CO.
6923 Quincy Avenue • Cleveland 4, Ohio
Manufacturers of water heaters and draft controls

WITH THE MANUFACTURERS

C. G. Hussey & Co., has relocated its local headquarters to 3900 N. Elston Ave. in the north west section of Chicago out of the congested traffic areas and has broadened its service organization and stocks in a move to provide the area with a faster and more complete service on copper, brass and non-ferrous metals and supplies.

The new warehouse provides more than 17,000 feet of floor space which accommodates a much larger and more diversified stock. Three separate truck entrances in the building expedite the movement of pick-up loads and facilitate shipments generally. In addition, the entire stock area is blanketed with overhead cranes which make all parts of the stock immediately attainable with a minimum of handling. The stock includes not only copper and brass sheet but all type of non-ferrous products for industry and the sheet metal contractor.

The Lau Blower Company regrets to announce the untimely passing of their Chief Engineer, Gordon Kinsman.

Mr. Kinsman had many friends throughout the heating and oil burner industry who will be shocked at this news because Gordon was always "just fine", regardless of how badly he actually felt.

Burial took place Monday, September 15, 1947 in Johnson City, New York.

Plans for the operation of Round Oak Company, Inc., a newly formed corporation which has purchased the inventory, patterns and trade name of the famous Round Oak Line of furnaces, coal stoves and ranges were announced recently by a group of veteran heating equipment manufacturers and businessmen who have assumed control of the new company.

At the same time the new Directors announced the appointment of Charles Mosher of Dowagiac, for many

(Please turn to Page 132)

ATTENTION: DEALERS, DISTRIBUTORS

An Opportunity to Sell
9 MILLION PROSPECTS

Distributors and dealers are now being appointed to merchandise and sell the RAYTHEON *Precipitator* — an amazing new electronic air cleaner for the home. At least 9,000,000 prospects are now ready to be contacted and sold throughout the U. S. A.

Take advantage of the existing and growing demand for this modern domestic appliance. Here is a real opportunity for *established* distributors and dealers to promote new sales . . . and to make additional sales to your present list of customers. RAYTHEON will back you 100 % with sales and advertising help and promotion cooperation.

Wire, write or telephone today to RAYTHEON, Waltham, or to the nearest district office

The Raytheon Home Precipitator is installed with any type warm air or ventilating system.

NOTE: In fuel shortage areas the Raytheon Home Precipitator is the logical product to promote sales for volume and profit.

RAYTHEON MANUFACTURING COMPANY
Commercial Products Division • **Waltham 54, Mass.**

ATLANTA
Roy E. Cawhorn
Raytheon Manufacturing Co.
306 Candler Building
Jackson 5325

BOSTON
John True
Raytheon Manufacturing Co.
Waltham 54, Mass.
Wal. 5860

CHICAGO
Howard W. Carlson
Raytheon Manufacturing Co.
Room 829, 222 W. Adams St.
Ran. 7457

CLEVELAND
L. P. Lamb
Raytheon Manufacturing Co.
902 Hanna Building
Maine 3730

NEW YORK
T. R. Porter
Raytheon Manufacturing Co.
60 East 42nd St.
Murray Hill 27440

RAYTHEON

Excellence in Electronics

SUN FUEL MASTER

OIL BURNING FURNACES

ATTRACTIVE
DEPENDABLE
EFFICIENT

AND AVAILABLE NOW!

PRICES ARE RIGHT
DELIVERIES ARE IMMEDIATE
FRANCHISES ARE AVAILABLE

Five Sizes—Bonnet Deliveries—
80,000 — 100,000 — 135,000 — 165,000 and 200,000 B.t.u.

We are now back in full production in our brand new factory building—making more and better SUN Fuel-Master Automatic Oil Furnaces than ever before.

NEW SIX-PAGE BROCHURE NOW READY

J. V. Patten Company
Sycamore, Ill.

years associated with Round Oak Corporation, as resident manager.

Mr. Frank M. Mutz, president of the new corporation, stated, "At this time we have on hand a large stock of repair parts in our inventory for the Round Oak line of furnaces, stoves and ranges. We are able to immmediately fill orders for repair parts for stoves, furnaces and ranges and will be able to replenish the present repair part stock to satisfy all old customers."

The new officers and directors, experienced people in the manufacture of warm air heating equipment, include: Frank M. Mutz, president; Harold M. Mutz, vice-president and treasurer; J. W. Barrow, secretary; Harry E. Yockey, Fay O. Ellis, and the Mesdames Catherine J. Wilding, Ruth M. Spencer, and Elizabeth Watts.

NICHOLS — Waste Removal

(Continued from page 89)

This velocity is figured for the nominal entrance diameter rather than the actual rectangular inlet to the collector which may vary slightly from the nominal diameter or size number.

If there is a screen collector included in the circuit, the additional resistance must be included. Under average conditions this is about 2 inches of water.

Pressure Drop Due to Changes in Velocity

In abrupt enlargement of pipes and consequently rapid drop in velocity there is a pressure drop which is usually considered as from ½ to 1 velocity head. The more abrupt the enlargement the greater the loss. Thus in the case of a chip trap where the enlargement is great the loss is complete, while where the enlargement is on a gradual taper the loss is minor and may be neglected.

With gradual contraction the pressure loss is small and may be disregarded. If the contraction is abrupt the loss is similar to the conditions at the entrance to a hood and may be allowed for accordingly. Abrupt contractions are rare in well designed exhaust systems, except in the outlet to spray booths, screen collectors, and similar equipment where the initial velocity is low and consequently any loss of pressure would be minor.

Other Pressure Drops

Collectors of the cloth bag or screen type are usually applied on the basis of approximately 2 inch pressure drop when the screens are dirty. When the drop builds up over this amount the screens are shaken down.

Oil type filters average .1 to .2 inch pressure drop.

Resistances of paper type filters vary with the kind of material collected and the frequency of cleaning. Unless definite data is available, it is suggested that this type of filter be figured at 2 inch resistance.

Incidentally, the resistance of all types of air filters varies with the air velocity through the filter medium (this factor determines the normal rating), the kind of material handled and the frequency of cleaning.

Where a branch joins a main pipe there is a pressure drop caused by the impact of the two converging streams. A pressure drop is produced both in the

We Manufacture ONLY Draft Controls

Draft KoreKtor

Cole DRAFT Governor

Sullivan Draft Stabilizer

Our business is solely the production of better draft controls—nothing else. All of our engineering know-how and every facility in our modern plant is devoted exclusively to building Barometric Draft Controls at reasonable prices—controls which can't be beat at any price.

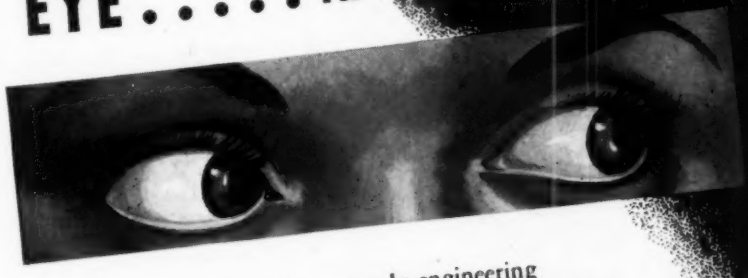
We have been manufacturing draft controls for years—for every type and size of heating and power installation. We believe we have the answers to any draft control problems you may have.

Write Us Today About Your Requirements

COLE-SEWELL ENGINEERING CO.

2288 University Ave. — St. Paul 4, Minnesota

There is more than meets the EYE . . . . . in BUYING BLOWERS



In selecting a blower consider not only engineering features and construction of the blower itself, think also of the reputation of the company from whom you purchase it. With materials short, have they been fair in their allocation? Have they done their level best to hold prices down and maintain your profit? Have they been co-operative and helpful in emergency situations and on special developments? You will find these added values, beyond the merchandise itself, when you buy from Brundage. Brundage offers you the combination that assures complete customer satisfaction; the best engineered blower available today, fine workmanship by craftsmen who know how to be careful, and fullest cooperation. When next you think of blowers remember, Brundage Is A Better Buy.

THE Brundage COMPANY

Blower Specialists Since 1919

502 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN

main and branch pipes. There is no reliable data available as to the exact effect of these losses, and since branches are customarily joined to the main at a smooth angle or are streamlined, the losses are small and may be neglected in determining the overall maintained resistance of the system.

Having determined the air volume and maintained resistance (fan static pressure) of the system, fan size is selected from published performance tables or curves. Usually a size is chosen which will operate near the point of maximum efficiency. Speed and horse power are read directly from the fan tables or computed from performance curves.

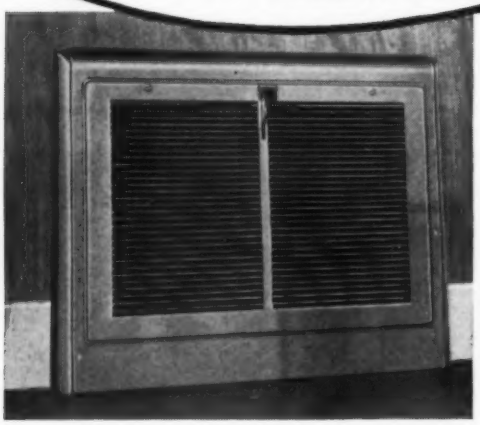
Since the exact effect of the variables involved in the computation of air volume and maintained resistance are seldom known to a high degree of accurancy, V belt drive is preferred to direct connection as it allows for changes in speed which may be required to adjust the fan performance to the actual operating characteristics of the system. Also V drive permits changes in fan performance to accomodate future revision in operation requirements.

For the same reasons it is desirable to choose a motor capacity of 10 to 25 per cent greater horsepower than the indicated requirements.

Typical Calculation of Piping System

Indicated on the accompanying sketch is a typical system for dust exhaust from grinding wheels. The connections to hoods were determined from the code requirements and problem requires that a minimum of 2 inch suction be maintained at all connections.

H&C No. 130 STILL THE *Finest* BASEBOARD REGISTER *for* GRAVITY *or* CONVERSION JOBS



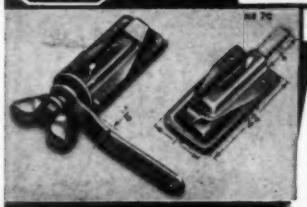
Flange for stackhead is welded to face of register.

Stackhead overlaps the register frame, preventing streaked walls caused by air leakage between frame and head.

By any comparison you wish to make the H&C No. 130 line is still the finest of the flexible-fin, dual-purpose baseboard registers. It's a highly attractive register in either our superb Metalustre or white — the two stock finishes; designed for neat convenient installation and streak-free operation; fitted with a valve that stays where you put it even in forced air applications. See it at your H&C jobber or consult the new H&C 1948 catalog which gives complete details on the ideal register for every type of installation. Ask your jobber for a copy or write direct.

HART & COOLEY MANUFACTURING CO.
World's Largest Manufacturers of Registers, Grilles, Furnace Accessories
H&C HOLLAND • MICHIGAN
In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario.

H&C *Kwik-way* DAMPER REGULATOR SETS

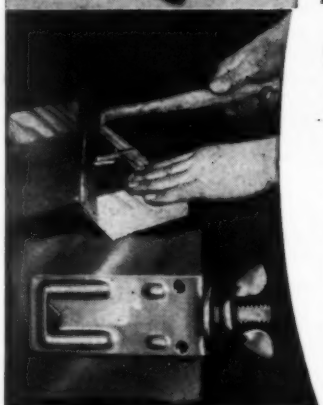


Most Easily and Quickly Attachable Sets on the Market

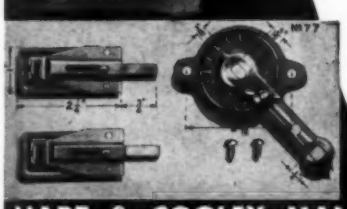
STURDY • RATTLE-PROOF

NO ANVIL REQUIRED

IDENTICAL 5/16" RETRACTABLE BEARINGS



Simply slip the bearing over the edge of the damper at the bearing line. Lay on any firm surface and strike one solid hammer blow. The prong pierces the damper and is clinched securely in place by the heavily ribbed underside construction of bearing. Fastening is permanently solid, rattle-proof. Identical bearings with retractable bolt make easier installation of regular or splitter dampers in round or square ducts.



LIST PRICES

No. 70 Set..... $0.30
No. 77 Set..... 0.40

FOR LARGE DAMPERS

No. 50⅜ Set..... $0.60
No. 80⅜ Set..... 0.60

See your jobber or write for literature.

HART & COOLEY MANUFACTURING CO.
HOLLAND MICHIGAN

EXTRA PROFIT For You

Install VITROLINER CHIMNEY LINING

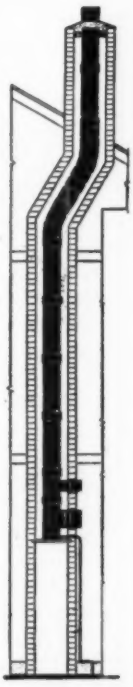
Dealers—You can quickly build up a thriving business lining old or new masonry chimneys—ideal for gas or oil fired heating plants where protection against acid bearing *condensation* is important.

VITROLINER insures longer life to the chimney—increases stack temperature (heats and cools quickly) providing better draft to carry gases out of chimney.

VITROLINER is made of heavy gauge steel completely coated inside and out with acid resisting porcelain fused into the steel at 1575° F. to prevent corrosion. VITROLINER drains the condensate harmlessly away into the ground preventing deterioration of brick work.

VITROLINER can be installed in a few hours. It will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT.

VITROLINER has been used for the past 18 years and is proven through a long field record.



We invite correspondence from reliable dealers who can contact and service installations in a few still available cities.

Write today for literature and prices.

CONDENSATION ENGINEERING CORPORATION
122 S. MICHIGAN AVE. CHICAGO 3, ILL.

FOR

QUALITY

METAL WORKING MACHINES AND TOOLS

the name is—

BARTH

BARTH offers a wide variety of Forming Rolls in 2", 2½", 3" and 4" diameter of rolls, with capacities up to 10 gauge.

The progressive and fast growing BARTH line includes Shears, Folders, a complete line of Bench Machines, Bench Plates, Stakes and many other items.

Write us for details.

THE BARTH MANUFACTURING CO.
MILLDALE, CONN., U. S. A.

The Original

OIL BURNING FLOOR FURNACE

Listed by UNDERWRITERS' LABORATORIES, INC.

Kresky OIL BURNERS

...Still the Leader

Originator of the oil burning floor furnace, Kresky has constantly kept the lead in this field, also producing the first floor furnace with forced air circulation bearing the Underwriters' Label. Inside is the dependable Kresky Burner, also a first, being the original mechanical-draft, air-induction oil burner. Low in cost, long in life . . . nearest thing to trouble-proof. Manual or automatic control. In use throughout the world, Kresky is enjoying unprecedented demand.

KRESKY MFG. CO., INC.

Pioneer in Oil Burning Equipment Since 1910

PETALUMA, CALIFORNIA

HEATING • COOKING • HOT WATER • INDUSTRIAL

The system will not be balanced after installation, but since it is relatively compact we will figure air volume to be handled by the fan on the assumption of 2 inch suction at all hood connections and add 10 per cent to cover unbalance effect.

Total Load Area in Square Feet

Two 5 inch connections	.272
Two 6 inch connections	.390
One 8 inch connection	.349
Total load area in square feet	1.011

Effective load area = $1.011 \times .70 = .708$

Air velocity at entrance. $V = 4000\sqrt{2}$ $V = 5660$

Cfm. = $.708 \times 5660 = 4000$

Adding 10 per cent to air volume to cover unbalance effect, fan cfm. = $4000 \times 1.10 = 4400$.

Maintained Resistance

In the system in question the maintained resistance or fan static is made up of the following element:

W = Work required to get the air into the exhaust sytem.

P = Pipe friction.

C = Collector resistance.

There are no abrupt changes in velocity of magnitude, so factor E may be neglected. Also there are no filter or other losses as represented by N, therefore, formula for maintained resistance reduces to

$R = W + P + C$

W = ½ suction or $2/2 = 1$

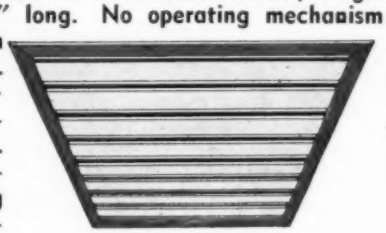
By inspection we determined that the point of maxi-

AIR-FLO AUTOMATIC CEILING SHUTTER

TOP VIEW - - OPEN - - LESS MOULDING

FOR ATTIC FANS

Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shows. Built-in fusible link. Meets Fire Underwriters requirements. Write for illustrated catalog 42-C of the complete AIR-FLO line.



VIEW FROM BELOW - - CLOSED (with moulding)

AIR CONDITIONING PRODUCTS CO.

2340 W. LAFAYETTE BLVD. DETROIT 16, MICH.

A good combination

You can build business and reputation on the strength of the two materials shown above—FIRELINE Stove & Furnace Lining and IRONSET *Asbestos* Furnace Cement.

FIRELINE is a plastic refractory material for lining firepots. It protects and preserves good castings; seals all cracks and holes in burned-out castings—prevents leakage of gas, odors, and dirt through the firepot. After baking out, Fireline withstands 3000 deg. F. Easily installed through the fire door—no new castings; no necessity for dismantling the furnace. Sold in 50 and 100-lb. drums; also in 5 and 10-lb. cans (60 lbs. per case).

IRONSET is highest-quality cement for setting up new furnaces and recementing old ones. You'll never know *real* cement until you try Ironset. Made by refractory manufacturers, it withstands higher temperatures without cracking or shrinking, bloating or blistering. Order a case of Ironset and try one can. If you don't agree that Ironset is the best furnace cement you have ever used, return the unused portion and get *double* your money back. Sold in 50 and 100-lb. drums; 5 and 10-lb. cans (60 lbs. per case); and 1-lb. cans (36 lbs. per case).

and FIRE-HEARTH, too!

Here's another good Fireline product. This castable refractory is ideal for setting stokers, for precast combustion chambers, and baffle tile. Just mix with water, pour into place, and trowel smooth. Sold in 50 and 100-lb. bags.

Fireline heating specialties are stocked by leading jobbers everywhere. For better jobs—for better reputation—use these better materials. Write for literature, prices, and discounts.

FIRELINE

STOVE & FURNACE LINING CO.

1816 Kingsbury St., (Dept. J), Chicago 14, Ill.

COMFORT for "Those Difficult Corners"

No. 256 4-WAY FLOW AIR-CONDITIONING REGISTERS

You can master any heating situation no matter how difficult—with U.S. No. 256 Air-Conditioning Registers. Multiple Valves provide an even flow of air over the entire grille area—proper up or down deflection is easily set by the knob at the right. Left or right directional flow, as required by room conditions, is quickly adjusted by the handy grille bar setting wrench. In precision construction, reasonable price, harmonizing finishes, and heating performance, No. 256 Registers will bring enthusiastic praise from your most exacting customers.

Catalog No. 47 is just off the press—send for your copy.

UNITED STATES REGISTER CO.

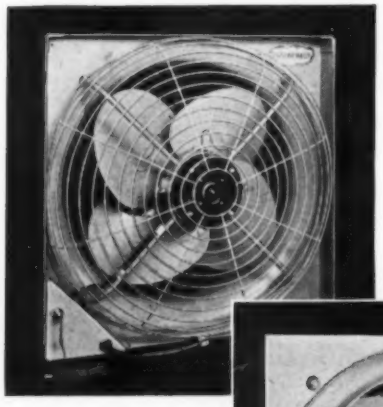
BATTLE CREEK, MICHIGAN

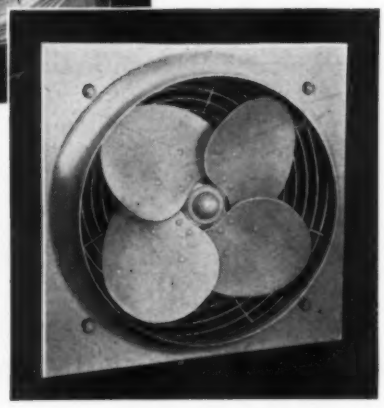
MINNEAPOLIS • KANSAS CITY • ALBANY

Fresh-Air-Maker
direct driven
Exhaust Fans

★ ★ ★ Three fine models—12″, 16″, 20″ have been added to the famous Fresh-Air-Maker line and are ready for immediate delivery.

★





•12″
•16″
•20″

All 3-SPEED fans—fine performers with high air delivery and surprisingly quiet operation. They are attractive in design and beautifully finished all over in ivory. Complete with cord and plug and convenient 3-speed pull switch so fan can be located high up and speed controlled if desired. Wire guards and manually operated louvers optional.

FRESH-AIR-MAKER, QUALITY · MATERIAL · WORKMANSHIP · PERFORMANCE · PRICED RIGHT

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WRITE FOR PRICES — IMMEDIATE DELIVERY

New Literature

SCHWITZER-CUMMINS
Ventilating Division
1145 E. 22nd STREET · INDIANAPOLIS 7, INDIANA
• BLOWERS
• VENTILATORS
• BLOWER WHEELS

mum pressure drop occurs at connection "D," so we start at that point and figure pipe friction "P" to the far end of the system, assuming uniform air flow equivalent to 2 inch suction at all connections. Incidentally, there is sufficient margin of safety in the friction formula to compensate for added friction due to unbalance of the usual system.

Substituting in the formula $P = L/50 \times 12/d \times i$ and allowing for the additional length effect of elbows we determine the friction drop in each section of pipe:

	Dia., inches	Friction
Riser "D"	5	1.110
Header D to C	10½	.148
Header C to B	12½	.182
Header B to A	14	.174
Header A to Collector	15	1.350
Total		2.964

Collector Resistance

$$R = .145 \times \frac{V^2}{(1000)^2}$$

$$R = \frac{.145\ (3290)^2}{(1000)^2} = 1.57 \text{ inches}$$

Fan Static

$R = W + P + C$

$R = 1 + 2.964 + 1.57 = 5.534$

Choose fan from performance table to deliver 4400 cfm. at 5½ inch static pressure.

THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of muss or fuss.

And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A. G. A. standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.

GAS Barnes Better Bilt FURNACE

For further information on the Barnes Better Bilt Gas Floor Furnace write today

BARNES HEATING & VENTILATING CO.
SALES OFFICE 330 E FOURTH ST. LONG BEACH 2 CALIFORNIA

HEATING UNIT DEALERS

Are you getting your share of EXTRA business in this big market?

STORES · SCHOOLS · SHOPS · FACTORIES
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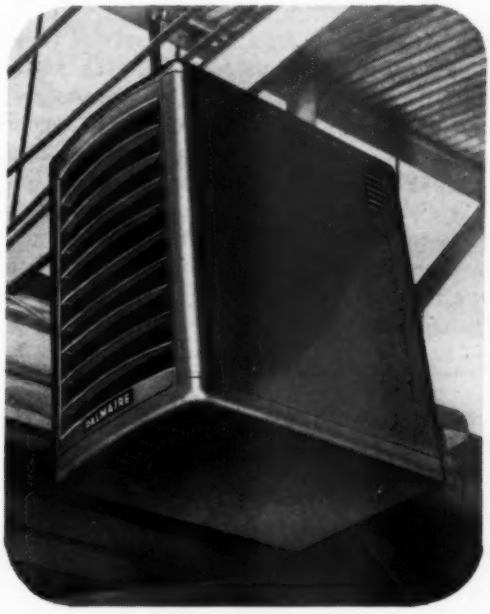
Palmaire

SUSPENDED UNIT GAS HEATERS

HANG FROM CEILING.. LEAVE VALUABLE FLOOR SPACE CLEAR



Palmaire heaters are perfect for business or industrial heating. Both you and the customer receive maximum satisfaction when you stock these AGA approved air-conditioning units.

Write for free descriptive literature . . . today!

LOOK AT THESE
EXTRA DEALER BENEFITS!

- Nationally advertised . . . recognized as an economical dependable heater throughout the nation.
- Guaranteed materials and workmanship on all Palmer products.
- Sales and advertising material available without obligation.

38 Years of Air Conditioning Leadership

Palmer Manufacturing Corp
Phoenix, Arizona

WINNERS!

Fiberglas Mop Yarns*

IN READY-MADE MOPS
OR FOR
YARN REPLACEMENT

Now you can get Fiberglas advantages in ready-made mops (names of manufacturers furnished on request) or in skeins for replacement. There's a size to meet your needs.

Fiberglas Mop Yarns won't char, burn or rot—*last up to 15 times longer* than organic yarns. They "thaw out" in two or three minutes after previous uses—and won't catch on fire when left on the job.

Get complete information on these easier-to-use, moneysaving mops and yarns now. Write: Owens-Corning Fiberglas Corp., Department 930, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Canada

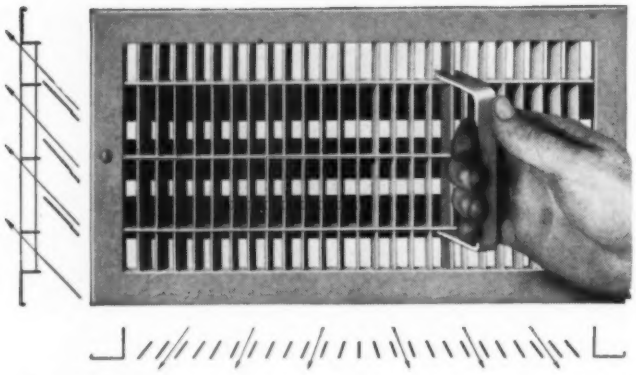
OWENS-CORNING
FIBERGLAS
U.S. REG. U.S. PAT. OFF.

MOP YARN

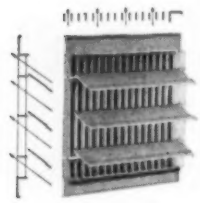
***Fiberglas is the trade mark (Reg. U. S. Pat. Off.) of a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.**

INDEPENDENT

"Fabrikated" WALL GRILLES WITH DEFLECTING VANES



Style 321-A grille with deflecting vanes



Rear view showing adjustable deflecting vanes

ACCURATE and positive compound deflection of air flows can be readily secured with these "Fabrikated" grilles. Directional adjustments may be made when grilles are installed; or grille bars and vanes may be adjusted after installation to meet unforeseen or changed requirements.

Each grille bar and each deflecting vane is adjusted *individually* with a special two-pronged tool included with each shipment. Locking of grille bars and vanes is not required because they are held firmly in place — no vibration — no rattle. Write for complete details.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET · CLEVELAND, OHIO

Compressed Air

(Continued from page 87)

with this power aid because he has both hands free for the actual work and there is less fatigue when compressed air provides the power instead of the man.

Shop conditions and wages vary in different sheet metal shops to some extent, but it would not be difficult to closely estimate the possible savings from the applications of compressed air decribed here to similar operations in other shops. And how has keeping alert to production economies worked with T. O. Sandell's shop?

Formerly a heating and ventilating engineer in Chicago, Sandell opened his own business in San Diego six years ago with "$50 and an automobile." He now has the largest commercial sheet metal shop in the city and is in the process of further expansion.

Nason

(Continued from page 75)

So the better the filters the more service is required. The higher grade the customers the better are the filters they use. Hence, the highest grade users are the best prospects for filter cleaning and reconditioning. Naturally enough, such customers usually permit the National company to drop around as often as they like, clean their filters whenever they seem to need service, send the customer the bill at the end of the month. National has many customers of this general sort who have confidence in the company not to abuse the arrangement.

REPAIR PARTS

for ... STOVES • FURNACES • BOILERS

also

FITTINGS • REGISTERS • SUNDRIES

and ...

FIVE GREAT LINES OF HEATING EQUIPMENT

★ ARMSTRONG! ★ MODERNAIRE!
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YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—

DES MOINES STOVE REPAIR COMPANY

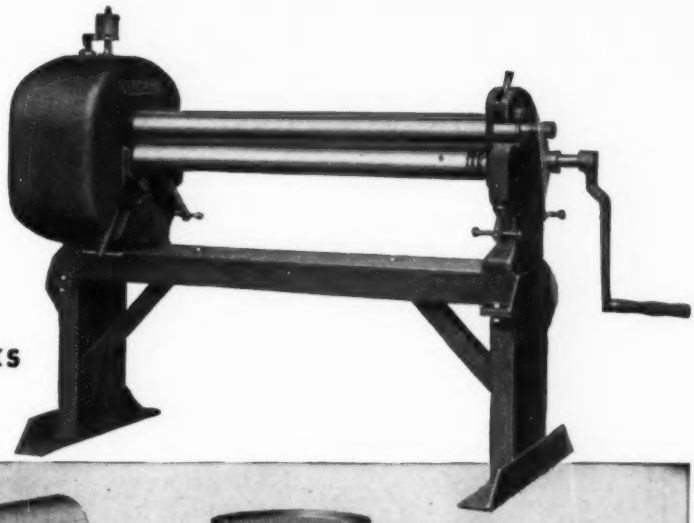
SAM C. GREEN
FRED R. GREEN

DES MOINES, IOWA
SINCE 1869

● **Sheet metal men make a great many things, including money, with Niagara Slip Roll Forming Machines.**

Niagara design makes them easy to operate because the end of upper roll swings forward so that formed cylinders can be withdrawn without distortion. Upper roll opens horizontally, eliminating lifting of roll or work. Trigger release speeds up unlocking, opening and closing upper roll.

Made in various sizes and capacities,—hand and power operated.

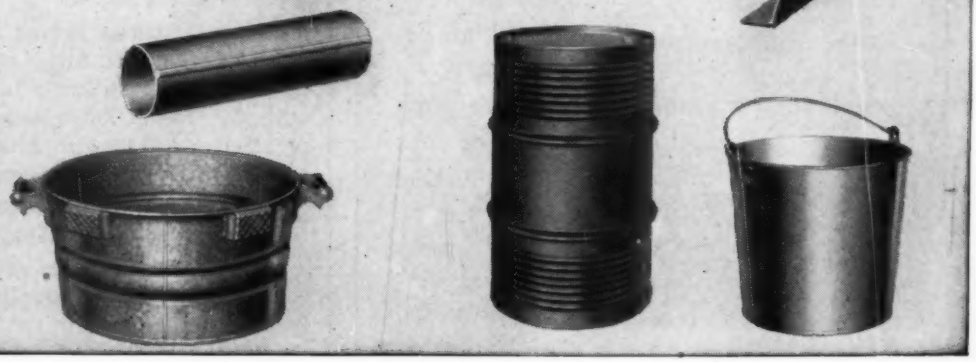


NIAGARA MACHINE AND TOOL WORKS

BUFFALO 11, N. Y.

District Offices: **New York, Cleveland, Detroit**

Typical Examples of the Work Done on NIAGARA SLIP ROLL FORMERS



Send Your Reservation NOW

for

AMERICAN ARTISAN'S SIXTEENTH ANNUAL DIRECTORY AND SHOW NUMBER

More residential air conditioning, warm air heating and sheet metal work will be done, and more equipment needed, in the coming year than in any other year for quite some time . . . and this year, as in the past, buyers will rely on AMERICAN ARTISAN'S complete and correct Directory Section to help them select their product and equipment requirements. This issue is the place to show your ENTIRE LINE. The Directory is used as a year 'round reference and your advertisement will receive maximum attention through our system of prominently "dotting" every advertiser's listings to guide buyers and specifiers to your pages.

Better drop us a note today enclosing your reservation for liberal space to enable you to show your entire line . . . use plenty of color and bleed also, to make your ad REALLY stand out!

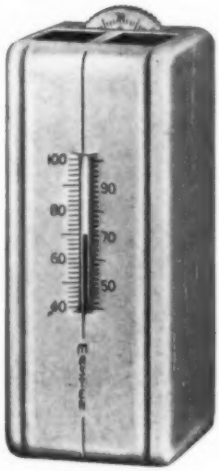
CLOSING DATE FOR COLOR FORMS IS DECEMBER 10TH. FOR BLACK AND WHITE FORMS, THE 17TH. Contact your agency today.

AMERICAN ARTISAN

6 North Michigan Avenue **Chicago, Illinois**

MASTER
TEMPERATURE CONTROLS

Earn their Reputation



as instruments by rendering precision-performance —every one!

Over a quarter century of knowing how and doing well has raised the name "MASTER" to a high position in the industry—a standard of long life, comfort and economy for your customers — friends and future sales for you.

A-23 Plain Thermostat

The policy of taking more pains than seems necessary in the manufacture of each individual part and inspection and test of each unit, pays in customer satisfaction . . . For this reason "Master" Controls are specified as replacements, and in more and more new construction.

D-22A Regulator Switch

The B-22 Master Control Motor is silent — powerful — low in current consumption.

They are available now for your installations.

B-22 Motor

Specify and install "Master". It is more than a name. It is a guarantee.

WHITE MANUFACTURING COMPANY
2368 University Avenue • St. Paul, Minnesota

Brown—
Bacteria Removal

(Continued from Page 79)

in order to allow bacteria to develop into colonies for easier observation and counting. Accurate counting of these colonies was obtained through use of another laboratory device known as a Quebec counter. The ratio between bacteria colonies on the vessels exposed to unfiltered air and those on vessels exposed simultaneously to filtered air provided the factor for arriving at efficiency figures. The accompanying photographs of these cultures illustrate the job done by filters.

Tests were repeated many times under the same conditions. Tests were also performed with various types of filters and at varying air velocities.

These variations proved that bacteria removal was most effective with filters using a media of an absorptive material with fairly heavy impregnation of filter adhesive. Reduction in adhesive decreased the degree of efficiency. Likewise filters using material of non-absorbent characteristics were less efficient.

Variation of air velocities within reasonable limits had little effect on efficiencies.

Although the bacteria colonies produced in the cultures on these tests were not identified as to species, it is a safe assumption that many were infection producing types. General characteristics of harmful and

PROFIT NOW!

WITH

GRAND RAPIDS FURNACE CLEANERS

It's easy to get a lion's share of furnace cleaning profits when you use a Grand Rapids Furnace Cleaner. Greater cleaning capacity, handling ease and practically designed groups of furnace cleaning attachments help you give better service and clean more furnaces per day at a higher profit.

Act now! Write today for complete information and prices.

DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W. Grand Rapids 7, Michigan

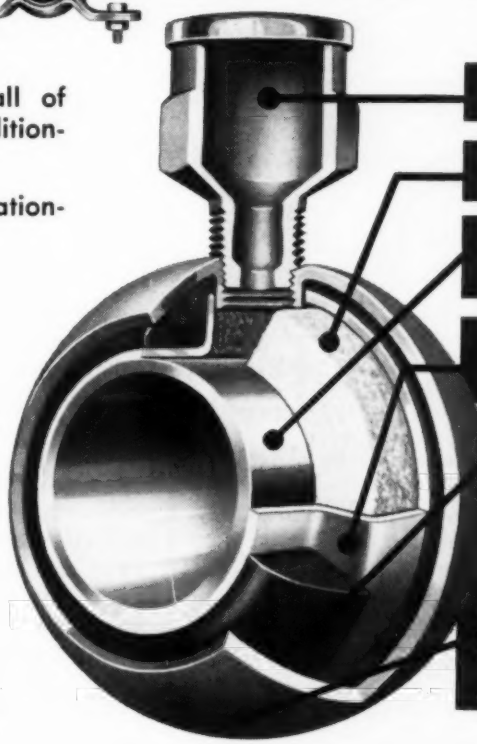
TRIANGLE PILLOW BLOCK

No other bearing provides all of these advantages for air conditioning equipment:

1. Quiet, shock-absorbing, vibrationless operation.
2. Perfect self-alignment.
3. Self-lubrication over long periods of service.
4. Scientific design for compactness and minimum obstruction to air flow.

Tell us your needs and we will send illustrations of various types of mountings, specifications and complete information.

TRIANGLE MANUFACTURING CO.
392 Division St. Oshkosh, Wis.


Large oil cup keeps wick saturated for years of operation.
Oversize felt wick feeds oil to bearing.
Porous bronze bushing feeds lubricant from wick to shaft as needed. Easily replaceable.
Steel retainer sleeve holds bushing, cushion and wick in proper relation.
Thick resilient oilproof cushion supplies a vibration-absorbing element between bearing and housing. Impervious to oil or hardening action.
Pressed steel ball formed around inner assembly holds parts rigidly in position and makes an oil tight seal. Assures perfect alignment through ball-and socket action.

Self FLUSHING!
Self CLEANING!

AUTOMATIC CLEANING NOW POSSIBLE IN THE NEW SKUTTLE HUMIDIFIERS

IT'S TRUE! Skuttle Automatic Humidifiers (Series 600*) are completely self-flushing, completely self-cleaning! All you do is raise the fingertip control switch to flushing position and Skuttle's new exclusive vacuum-controlled cleaning system does the rest . . . flushes the entire unit, drains off all water, sludge, mud and mineral deposits, then automatically trips off to allow unit to refill again to valve adjustment level! No hand scraping required, no clean-out panel necessary! Simple, convenient, foolproof!

The series 600 saves you installation time over any other type of humidifier.

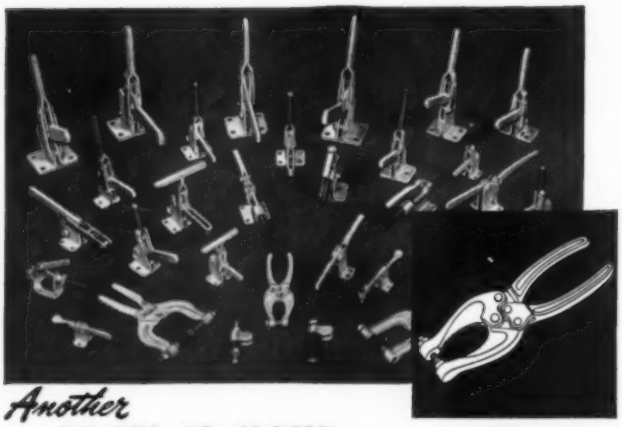
**Patents Pending*

OTHER IMPORTANT SKUTTLE "600" FEATURES

- ★ *Drawn seamless copper pan (3" x 12").*
- ★ *Replaceable VAPOGLAS* evaporating plates.*
- ★ *5 plates furnished. Evaporating area 316 sq. in.*
- ★ *Automatic anti-siphon float control valve.*
- ★ *Collar fits sloping or vertical bonnets.*

See your local jobber or write today for state listings and the complete Skuttle story!

Skuttle MANUFACTURING CO.
4099 BEAUFAIT, DETROIT 7, MICHIGAN



Another
DE-STA-CO CLAMP Designed to *Take It!*

A new addition to the versatile De-Sta-Co family of production clamping tools. No. 464 Portable Clamp designed for sheet metal work. Positive toggle lock holds parts fixed for drilling, riveting, welding. Speeds assembly of ducts, housings, cabinets, auto bodies. Ideal for template work.

No. 464 Plier Clamp offers a firm hand grip for opening and closing. Jaws clear flanged metal edges. Adjustable for efficient pressures. Narrow nose for close spaces. Entire tool is forged and can be altered easily for special application. Replaceable hardened steel bushings minimize wear. Write for additional information on Model 464, or catalog No. 47 describing complete line.

De-Sta-Co clamps are stocked in principal industrial centers

DETROIT STAMPING COMPANY
341 Midland Ave. Detroit 3, Mich.

harmless bacteria are similar and these tests prove that bacterial air contamination can be greatly reduced by efficient air filtration.

Since many of mankind's common respiratory diseases and other infections originate from contaminated air, this function of air conditioning and forced warm air heating systems may have an important benefical influence on the health of the occupants of homes and public buildings so equipped—a strong argument in favor of forced air, filtered installations.

Mirabile—

(Continued from page 73)

tank. Use swing joints as shown in the sketch and always run it high enough above the ground to prevent snow from covering it. (See local regulations).

The fill stand pipe must be at least 2" in diameter, this opening is also used to measure the height of oil in the tank. If the fill pipe is extended horizontally away from the tank it must also pitch down so that it will drain towards the tank. Never use the tank opening next to the fill line for suction line; always keep the return and fill line away from the suction line. Oil going into the tank will drop to the bottom and carry air with it. This air may get into the suction line and this may cause pump noise, etc. The fill pipe should have a watertight fill cap.

The return piping should be connected as shown and a check or gate valve may be inserted in the return line to prevent oil from coming out of the return line when the pump is serviced, etc.

Where you see PEXTO you see PERFORMANCE

Heavy Rotary Machine

By "performance" we mean everything you require for top quality Sheet Metal fabrication . . . rigidity of machine, ready response to controls, accurate production, years of profitable operation.

No. 0325 Slitting Shears

THE PECK, STOW & WILCOX COMPANY *Since 1785* **SOUTHINGTON, CONNECTICUT, U. S. A.**

WE QUOTE:-

. . . . . "it is very questionable whether the estimated sheet and strip output totaling 19,500,000 tons for 1948 will come anywhere near the demand; current production is reported at the rate of 17,800,000 tons."

AND

. . . . . "it has been previously stated that the steel industry expects to ship approximately 15,000,000 tons out of the country in 1948." (This figure is for ALL kinds of steel—not only sheets and strips.)

WE REPEAT:-

"The time is not yet when you can have all the HANDY PIPE you want —but our production is UP—just as far UP as we can push it!—and we promise you that in 1947 (and 1948) we will fill every order that MATERIALS and increased facilities permit."

F. Meyer & Bro. Co.
Peoria, Illinois

"SELL" YOUR PROSPECTS ON

Healthful Economical

HEATING

WITH

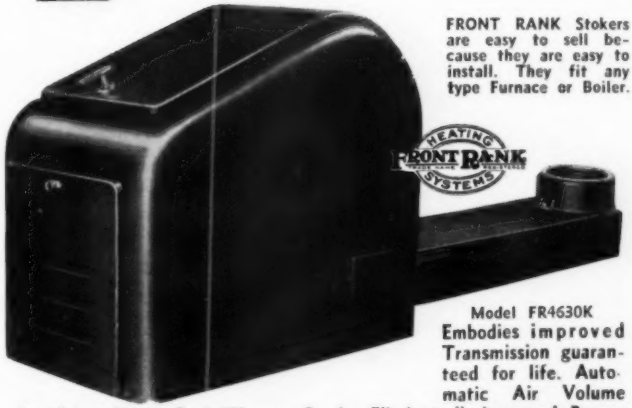
FRONT RANK

Automatic Dependable **STOKERS**

AND BE FIRST IN SALES

FRONT RANK Stokers give more heat from the coal, freedom from trouble, long life and low power consumption. Fully automatic operation throughout the heating season. The thermostat is set at desired temperature and Stoker builds up or decreases the fire in accord with change in the weather. Eliminates waste of overheating. Built to last, FRONT RANK Stokers give heating satisfaction for years to come! Sell FRONT RANK and you build prestige and greater profits for yourself.

FIT ANY FURNACE or BOILER



FRONT RANK Stokers are easy to sell because they are easy to install. They fit any type Furnace or Boiler.

Model FR4630K Embodies improved Transmission guaranteed for life. Automatic Air Volume Regulator, Triple Seal "Hopper Smoke Eliminator", improved Burner Head and balanced Power Plant. There's none superior!

Your Always Out Front With FRONT RANK—Order From Your Jobber

FRONT RANK FURNACE CO.
DIVISION OF LIBERTY FOUNDRY CO.
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FOR NEW FURNACES
FOR FURNACE REPAIR
ONE POUND NET WEIGHT
THARCO
Asbestos
FURNACE CEMENT
MADE ONLY BY
THE ARMSTRONG COMPANY
DETROIT - MICHIGAN
"Tops"
IN HEAT RESISTANCE AND ADHESION . . .
Leading furnace manufacturers and skilled furnace repairmen insist upon Tharco Asbestos Furnace Cement because it has been processed, by the secret Armstrong formula, to meet every demand of easy workability, high heat resistance and adhesion. Tharco Asbestos Furnace Cement never shrinks, checks or powders when properly applied. It seals both sides of the joint making it gas tight and smokeless yet has resilience enough to absorb all normal expansion and contraction. You, too, will find that Tharco Asbestos Furnace Cement is tops in heat resistance and adhesion—and tops on every count that adds up to highest quality in furnace cement.
THE ARMSTRONG COMPANY
4065 SO. LA SALLE STREET, CHICAGO
241 SO. POST AVENUE, DETROIT
319 SO. CROWDUS STREET, DALLAS

Wage Incentive Plans

(Continued from Page 66)

most grievances. This condition prevails whether the payment is on the basis of day work or wage incentive.

Hence, during recent years much emphasis has been placed upon job evaluation and wage classification. The result has been a more logical payment of workers, graded by skill, responsibility, working conditions, and other characteristics.

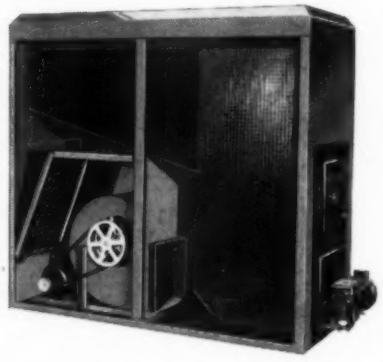
Wage Incentives in General

As previously stated, day work was the usual method of wage payment in the early days of the industrial era and straight piece work was a simple form of wage incentive to increase production.

Many companies on a day-work basis have set up methods of assigning different hourly rates to employees within the same job class, depending on their record of production, quality, seniority, etc. Regardless of all attempts to regulate the wage structure, there seem to be chronic difficulties concerning questions of production if the latter are not definitely tied to wages.

After workers are assured of regular known earnings, it becomes management's function to secure the maximum production which can reasonably be expected. Such endeavors often result in allegations of aggressive "speeding up," either through assembly-line processes, or by individual goading.

On the other hand, particularly where management has not set up carefully determined standards of production, there come into being rates of production—often set up spontaneously by groups of employees—which peg production and which make it clear to in-



Dealer profits depend on sales. Sales, now-a-days, depend largely on freeing the customers mind from worry over fuel shortages. That's why we say—investigate this radically new Vapor-Oil furnace,—easily convertible to gas or coal—yes, and even wood if occasion demands.

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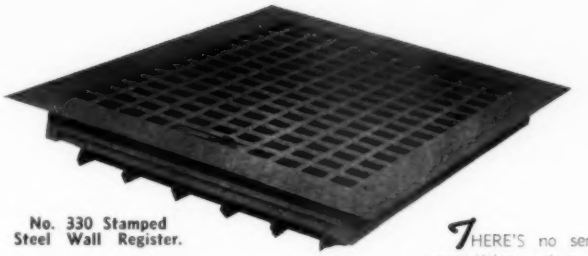

No. 330 Stamped Steel Wall Register.

THERE'S no sense trying to meet competition unless you're prepared to offer a complete line of registers, grilles and air diffusers.

A-J **is a complete** line, offering the finest in air outlets to perform under the most exacting conditions and to harmonize perfectly with the latest architectural designs. Grilles are available in plain lattice, slotted, or many ornamental faces; registers in wall, ceiling or floor type with fixed or adjustable deflections, and horizontal louvers if desired.

More complete details available by simply dropping us a postcard requesting a catalog. **Please do it today.**

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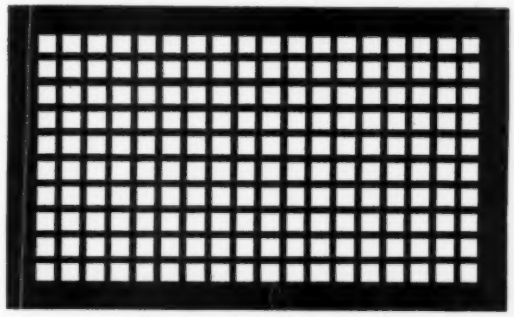
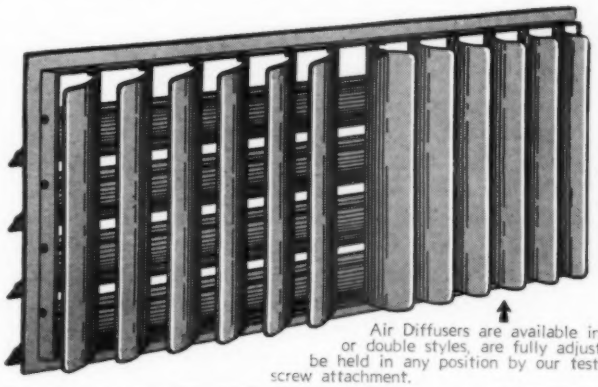
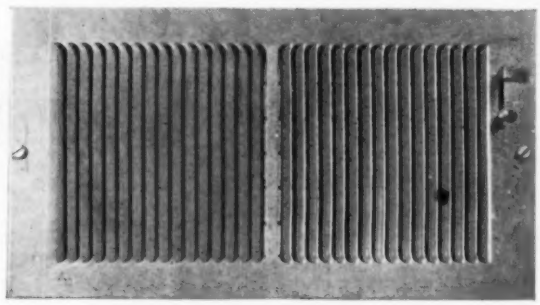


Plain Lattice Design. Available in No. 16, No. 14, No. 12 and No. 10 U. S. Standard gauge.



Air Diffusers are available in either single or double styles, are fully adjustable and may be held in any position by our tested method of screw attachment.

Directional Flow Register No. 10 Series for Forced Air Installations.



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FOLLANSBEE *seamless* terne roll roofing for ridges, valleys, flashing, gutters

Ridge, Valley and Clapboard Wall Conditions with Standing Seam on Ridge Below and Flat Seam Above

Detail of Valley with Standing Seam Roof

In fact, you can do a better job with FOLLANSBEE SEAMLESS TERNE ROLL ROOFING regardless of structural conditions or roofing specifications.

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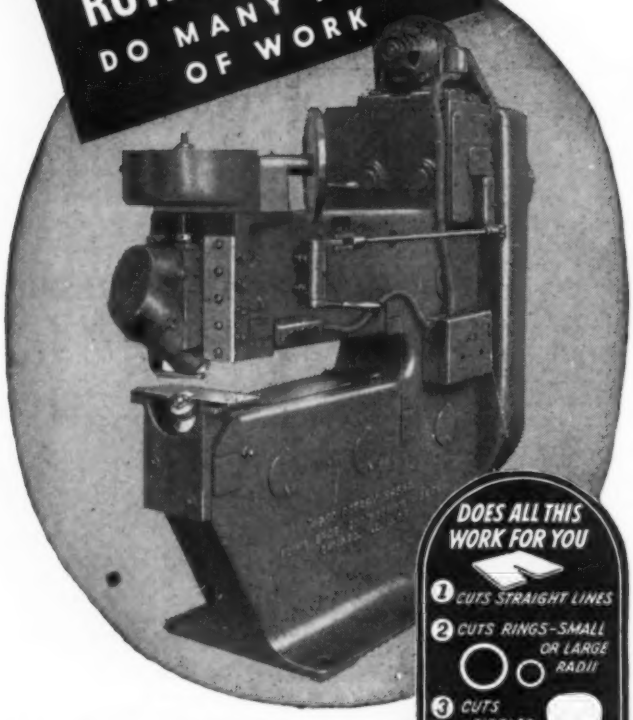
ROTARY SHEARS
DO MANY TYPES OF WORK



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3 CUTS CIRCLES
4 MAKES FLANGES
5 CUTS INSIDE HOLES WITHOUT CUTTING IN FROM EDGES
6 JOGGLES & OFFSETS
7 CUTS ODD SHAPES
8 BEVELS OF ANY ANGLE
9 CUTS REVERSE CURVES
10 BEADS & [illegible]
ALL WITH Hairline PRECISION

Yes, and With Hairline Precision

Rapid operation . . . Hairline Accuracy . . . the use of Kling Rotary Shears marks the latest development in cutting mild steel, and sheet metal, up to 1-inch with amazing savings in time, labor, and production costs.

For exacting projects (see illustration at the right), no single unit of metal-working equipment does so many different things so clearly and efficiently as does the Kling Rotary, pictured above.

In metal working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done, — this machine is held in high regard for its versatility and economy of operation.

This great usefulness is the result of half-a-hundred years of engineering experience which prospective buyers, with reason and repect, applaud.

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which will give you specific facts, and specifications. No obligation involved. Users of heavy equipment of Kling Rotary Shears' class will receive a copy of this Bulletin promptly, on request.

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dividuals that it would be best not to go beyond this point. This curb on maximum production is a carry-over from the depression era and stems from the belief that restricting production will result in greater job security. Incentives and plant-wide dissemination of production information seek to counteract this attitude.

Many forms of nonfinancial incentives to production increases also have been developed by industry. These include recreational facilities, cafeterias, the publishing of quotas and performance of workers, and arrangements for adequate transportation to and from work. Financial incentives include quality bonuses, foremen's bonuses, and profit-sharing bonuses. All of these are important. This series, however, considers primarily the financial wage incentive plans for the purpose of increasing production.

OIL SUPPLY

(Continued from page 65)

(1) the number of cars in use which are now at, or near, prewar levels and the fact that the owners are using them more; and that the old age cars in use are less efficient and consume more fuel;
(2) Consumption of gasoline on farms is approximately double that of prewar largely because of the increased number of tractors in use, and
(3) Home heating and Diesel locomotives have increased tremendously the demand for fuel oils.

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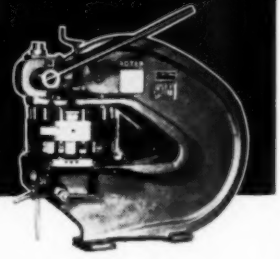
quick change
PUNCH



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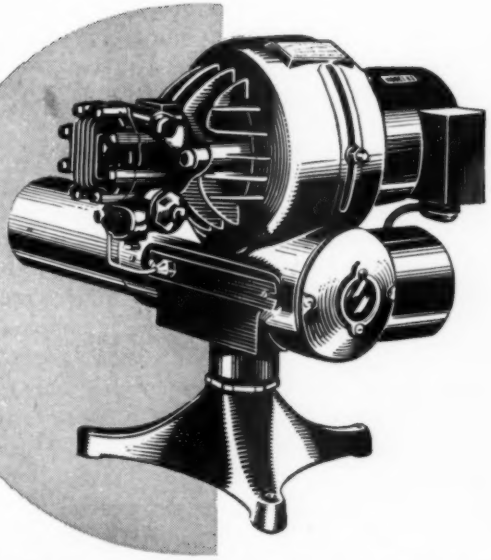

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QUALITY PRODUCT — Nu-Way "XL" Oil Burners are designed to meet every requirement for home comfort, convenience and efficiency. The design is a model of simplicity — completely free from superfluous attachments.

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NEW SALES HELPS — Includes new mats for local newspaper, 8 page consumer book, telephone directory cuts, big new and improved catalog and instruction book.

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Air Conditioning by Schwerin Air Conditioning Corporation

Simply designed air diffuser blends with interior

Provides complete air conditioning comfort by eliminating drafts, noise, hot or cold spots.

In addition to their unobtrusive appearance, Kno-Draft Adjustable Air Diffusers are specified for installations like the one pictured here in the offices of Schwarzenbach-Huber Co. because they combine all the advantages of scientific air diffusion plus adjustable features which assure positive air pattern control.

Kno-Draft adjustability increases efficiency and economy.

Diffusers improve occupant comfort by delivering conditioned air gently and thoroughly. Drafts and noise so often experienced with grilles, registers and other louvered devices are eliminated. Economy is increased. Diffusers handle greater air velocities and greater temperature differentials. This means less air volume, smaller, simpler ducts and fewer outlets.

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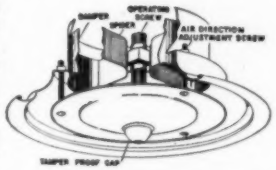
Kno-Draft Direction Adjustment assures positive air pattern control by affording any angle of air discharge from vertical to horizontal that is needed to accommodate ceiling heights, individual or seasonal requirements. Volume adjustment is made with a patented damper that regulates the amount of air without affecting the velocity or diffusion pattern.



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Indicative of the supply situation in the mid-west, for instance, is the decline of production of crude oil in Illinois and Michigan. In the four weeks ended July 5 the average daily crude production in Illinois was 186,850 barrels compared with 208,600 barrels in the similar period of 1946, and 362,700 barrels a day average in 1941. For Michigan the decrease in production is less marked but significant under present conditions of demand. Michigan's daily average production of crude oil in the four weeks ended July 5 of this year was 43,650 barrels, while in the same period of 1946 it was 47,100 barrels and for all of 1941 it averaged 44,800 barrels.

Because of the decreases of crude production in these two states, refineries in the mid-west have been forced to seek crude supplies from other areas. Several pipe line projects to bring in more crude would have been completed before now if supplies of steel had been adequate. Coal and steel strikes, and the general shortage of steel has delayed construction by anywhere from several months to more than a year. *East Coast:* The east coast supply situation depends largely on transportation. The expected increase in demand will make necessary an increase in volume of crude oil and products (principally heavy fuel oil) from foreign sources and the Gulf Coast.

Imports of crude oil and refined products to the United States, most of which come into the east coast, have been at peak levels this year, those for the first six months being estimated at 83,250,000 barrels against 65,348,000 barrels in the corresponding period

Production is Rolling··

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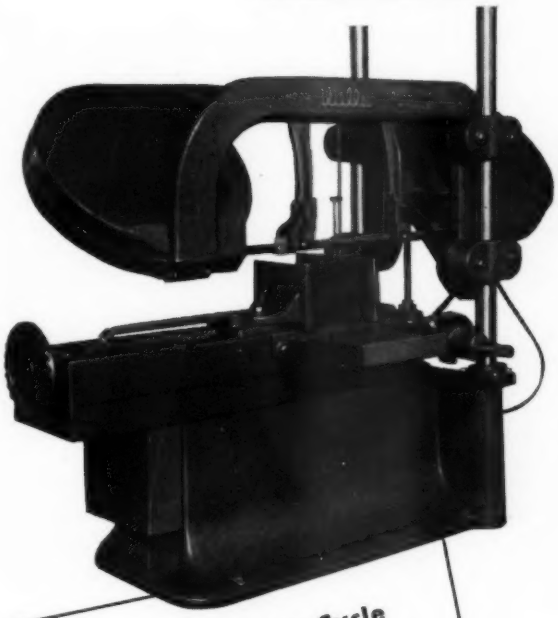
the new WELLS No. 12



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CAPACITY	Rectangular, 12" x 16"; Rounds, 12¾" O. D.
Die Blocks	12⅛" depth; 16" width; Clearance 18" bed to blade
MOTORS	½ H. P. and ¾ H. P., A. C. or D. C.
SPEEDS	Selective, 50, 90, 150 feet per minute
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of 1946. For the full year 1946 imports totaled 135,033,000 barrels and in 1941 they were 97,142,000 barrels.

The industry's storage capacity for fuel oil on the east coast is a limiting factor on the amount of fuel oil that can be transported into the area during the summer. The peak of demands for fuel oil this coming fall and winter, which demand it is believed will be at a new high, will place an additional burden on transportation. The best estimate for the east coast is that overall requirements for the immediate future will be met, provided of course, that an abnormally cold winter is not experienced and that there is no shortage of substitute fuel.

At present refinery operations of the east coast industry are exceeding rated capacity, with some uneconomical units also operating. One of the largest refineries is operating at 193 percent of its original rated capacity, with several other units in the area at about 140 percent of such capacity.

West Coast: The west coast statistical position appears to be satisfactory both from the standpoint of supply and local demand, although best estimates are that while the industry will meet all potential demands, it will require everything it can produce.

Gulf Coast: There is no problem of supplying the demand in this area, it being the largest crude oil producing section and, in addition, having the largest refining capacity. It is an important source of supply of crude oil and products to the east coast.

Problems

As stated under "Supply", the principal problem confronting the oil industry today is a lack of adequate

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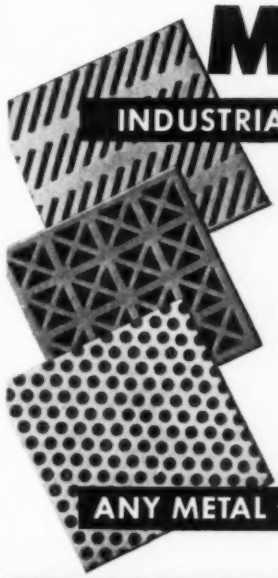

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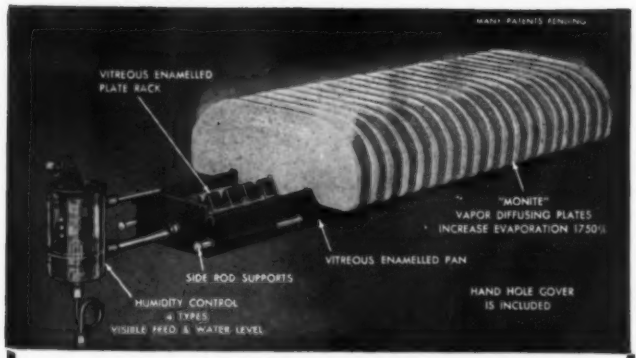
transportation facilities, especially of pipe lines, tank cars and barges. Barge equipment is sufficient to meet current requirements except for movements on the Mississippi and Ohio Rivers. Construction of these facilities, as well as others for refining, production and marketing divisions of the industry, are being delayed by shortages of essential materials such as casing and tubing of all kinds, line pipe, compressors, pumps, plates, structurals, castings, sheets, tin mill products, electrical equipment, high and low pressure tank cars, valves and fittings.

Shortages of these materials have made it impossible for the industry to proceed with scheduled expansion and modernization programs. It is estimated that lack of these materials has delayed construction programs anywhere from several months to two or three years.

The situation is especially critical in respect to tank cars needed for the transportation of liquefied petroleum gas (bottled gas) for which an estimated 2,371 cars are needed, but the steel available for such cars is wholly insufficient for needed facilities during 1947. The Office of Defense Transportaton has estimated that 5,279 of these cars will be needed to meet fall and winter requirements of bottled gas. Against this figure there are only 2,908 in service, including 438 which are government owned.

Allocations for the construction of at least 7,500 low pressure cars for petroleum transportation also are necessary to bring the fleet of such cars up to their prewar level. This class showed a decrease of 6,000 cars between January 1, 1945 and January 1, 1947, and none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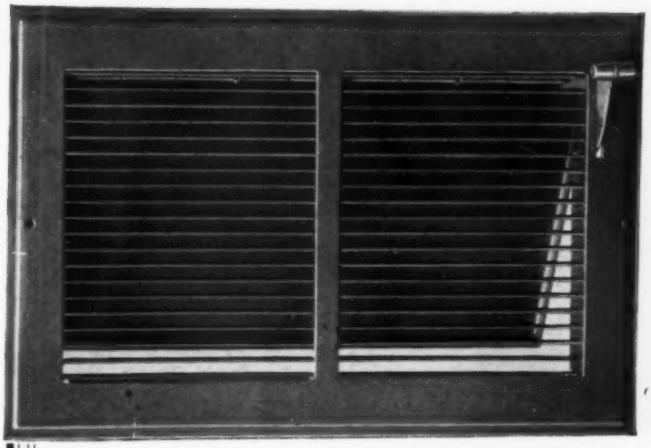

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Factory Representatives Wanted for Some Territories.

EASY *EXTRA* PROFITS
on every Automatic-Heat installation

Lowest Cost **HOME INCINERATION available!**

Majestic No. 30 FUELLESS HOME INCINERATOR

Low cost and "self-burning" action bring quick sales for this easy-to-install incinerator—especially where automatic heating prevents rubbish-burning in the furnace! Burns wet or dry garbage and rubbish; advanced down-draft action dries the waste constantly. Contents need be ignited only once or twice a week; ashes removed only once or twice per month. Unit is only 2 feet in diameter, less than 3 feet high! Uses any 8-inch flue; will not affect heating-plant efficiency if tapped to furnace flue. Handsome silver-and-blue duotone finish! *Write for details!*

FUEL-FREE
FUME-FREE
FUSS-FREE

The Majestic Co.
842 Erie Street
HUNTINGTON, INDIANA

Nationally Advertised Home Necessities for Over 40 Years.

"Made-Rite"

DUCTS
•
SMOKE PIPE
•
FURNACE PIPE
•
FURNACE FITTINGS

You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.

"Made-Rite" Co., Inc.
10th & Monroe St. Newport, Ky.

Sell CLEAN AIR —the year 'round with RAYTHEON HOME PRECIPITATORS

"Slack" seasons are eliminated for dealers selling their customers Raytheon Home Precipitators. These dealers can show how desirable *clean* air is the *year 'round*, how it's easily and economically maintained with this versatile unit . . . and they know they can *depend* on deliveries from Proie & Coogan. Investigate today, we'll be glad to send literature.

We are distributors in Pennsylvania for Raytheon Precipitators in the following counties: Erie, Crawford, Mercer, Lawrence, Beaver, Washington, Green, Fayette, Westmoreland, Allegheny, Butler, Vanango, Warren McKean, Forest, Clarion, Armstrong, Somerset, Cambria, Blair, Clearfield, Elk, Cameron, Jefferson, Indiana.

PROIE & COOGAN HEATING CO.

WHOLESALE DISTRIBUTORS FOR INDOOR COMFORT SUPPLIES • ROOFING MATERIAL

6117 BROAD ST. PITTSBURGH 6, PA.

MO ntrose 9300-01

of this type has been built since 1942, nor is any under construction at the present time because steel is not being made available for the purpose.

What the Industry Is Doing

A. To meet rising demands for its products the oil industry is making record capital investments of more than four billion dollars in the two year period—1947-1948—to provide for new and expanded facilities throughout the country, i.e.,

1. It will drill this year an estimated 35,000 new oil wells, a new high record, including approximately 5,000 wells for exploratory purposes in the hope of finding new oil reserves. In the production division alone, the industry will make capital outlays estimated at more than two billion dollars in the two-year period;

2. It has plans under way for construction of refinery facilities having a capacity of about 450,000 barrels of crude daily, but the construction of these installations will take from six to twenty-four months from the start of construction. There is a prospect that this figure will be augmented in the near future. Expenditures for refining facilities in the two years are estimated to exceed one billion one hundred million dollars.

3. It is building new pipe lines, and expanding old ones, as well as providing for other transportation equipment on which it will make an aggregate investment in 1947-1948 of approximately four hundred forty million dollars; and

4. It is investing about four hundred eighty million dollars in new marketing facilities.

ANGLE RINGS

MACHINE ROLLED

FOR YOUR REQUIREMENTS

Angle Rings to size with or without rivet or bolt holes—accurately rolled with uniform curvature.

ROLLED RIGHT—by experienced operators with the ability and knack of turning out angle rings to your complete satisfaction.

You'll enjoy fitting them in on the job—used for installing air conditioning wall fans and all types of reinforcing and joining pipe, etc. Write for list of sizes and discounts.

Our modern well equipped plant produces economically many different fabricated products. "Fabricating to customers specifications and prints" has enabled us to accumulate a large stock of punches and dies for piercing, blanking, notching and forming, which are available. Let us know your fabricating requirements.

Write today for our circular illustrating the scope of our service.

NATIONAL METAL FABRICATORS

2136 S. Sawyer Ave. Chicago 23, Ill.

PERFORMANCE PLUS!

ATH-A-NOR Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

Manufacturers of Quality Heating Equipment for Over Fifty Years.

Newark Ohio

EFFECTO-GRILLE

Beauty and Performance Combined

SERIES NO. 200

AIR CONDITIONING LINE

Horizontal, Adjustable, Fin-Type
Single Shutter Valve

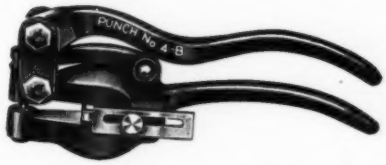
We also Manufacture a Complete Line of GRAVITY REGISTERS and GRILLES.

Series 200 registers were designed by engineers of long experience in the heating field, which accounts for their high efficiency and our ability to offer them at a very popular price.

TURNBULL *MANUFACTURING AND DISTRIBUTING CO.*

9930 Freeland Ave. **Detroit 27, Mich.**

A REAL *Time Saver*



The No. 4B PUNCH by *Whitney*

This punch is accepted by leading contractors and dealers as a real time-saver in the shop and on the job. Men who use it every day know it can't be beat for clean, fast punching. Has a capacity of ¼" through 16 ga., weight 3 pounds, 8½" in length, depth of throat, 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL

RIVERSIDE

SLIP ROLL FORMING MACHINE

Change MINUTES to SECONDS

Jobs that used to use up several minutes can now be done in a few seconds with a Riverside Slip Roll Forming Machine. All adjustments for gauge of metal and curvature of the sheet are made from the front. There is no need to reach around in back to adjust rolls. Another feature of this machine is the new radial adjustment which minimizes flattened area of rolled sheets regardless of curvature. Furnished in both 37" and 31" roll lengths.

Riverside Machinery Co.
Shakopee, Minnesota

WARM AIR PIPE and FITTINGS

There's a great difference in warm air pipe and fittings even though they might look alike. The difference lies in the integrity and capability of the manufacturer and those are mighty important points to consider. Are you able to get fittings that will consistently FIT the first time, be absolutely dependable, and be priced accordingly? If not, then you'll be doing yourself a favor by investigating our line. We make an honest effort to supply the finest in warm air pipe and fittings and an investigation on your part will convince you. Please write us today for more information.

RALPH SUPPLY INC.
Manufacturers of Warm Air Pipe and Fittings
P. O. Box 158 **Wadsworth, Ohio**

YOUNGSTOWN FITTINGS FIT!

IT ISN'T mere happenstance that makes our statement correct. We plan our products, pipe and fittings for gravity and winter air conditioning, so that they "go in" with a minimum of time and change. We'll be getting more metal soon (we hope) and want you then to ask your Wholesaler about our lines.

YOUNGSTOWN FITTINGS FIT

YOUNGSTOWN FURNACE COMPANY

627 Marshall Street Youngstown, Ohio

B. The industry has built the nation's proved crude oil reserves to a new record and is maintaining production of crude oil at high rates, consistent with sound conservation practices, to assure the nation an adequate supply of products even though some of the production operations are costly.

C. It is operating some obsolescent refining capacity in addition to its modern, more efficient facilities, to serve public, military and industrial demands, and, as stated under "Supply", some of these refineries are operating well above their rated capacities.

D. It is transporting crude oil and products from the southwest to the middle west by tank cars at greater expense than by pipe line and barge.

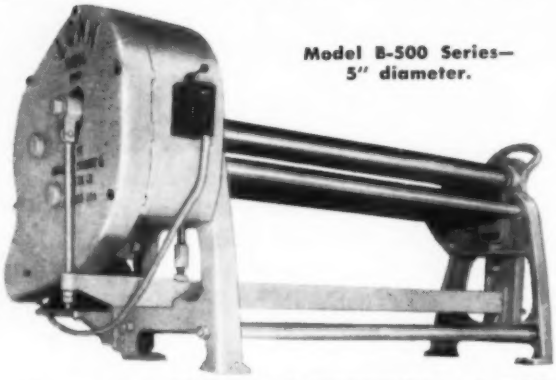
What the Public Can Do

To assist the industry in stretching the available supplies, and making the most of existing transportation facilities, the consuming public can render material aid by:

1. Driving in a more conservative manner and taking good care of automobiles, thus spreading gasoline supplies in each area and making it possible for all car owners to get the supply they need.
2. Filling, and keeping filled, its fuel oil tanks so that the industry can utilize its storage capacity at maximum to prevent a local exhaustion of supplies, and
3. Maintaining moderate temperatures in homes during the coming heating season, thus spreading supplies so that no one suffers discomforts from lack of fuel oil.

LOWN SLIP ROLL FORMING MACHINES

FIT YOUR JOB!



Model B-500 Series—
5" diameter.

If you want MORE PRODUCTION and ECONOMICAL OPERATION, use LOWN Slip Roll Forming Machines.

Our machines are designed for sturdiness and ease of operation to provide peak productivity.

Rugged — Rigid — Attractive — Prompt Deliveries.

The LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements.

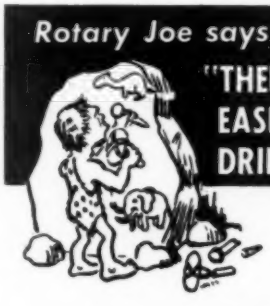
SAN ANGELO FOUNDRY & MACHINE CO.

San Angelo, Texas . . . . . E. Upton & SFE Tracks

Distributors in Most Principal Cities — Write for Bulletins.

Rotary Joe says:

"THERE'S AN EASIER WAY TO DRILL CONCRETE"

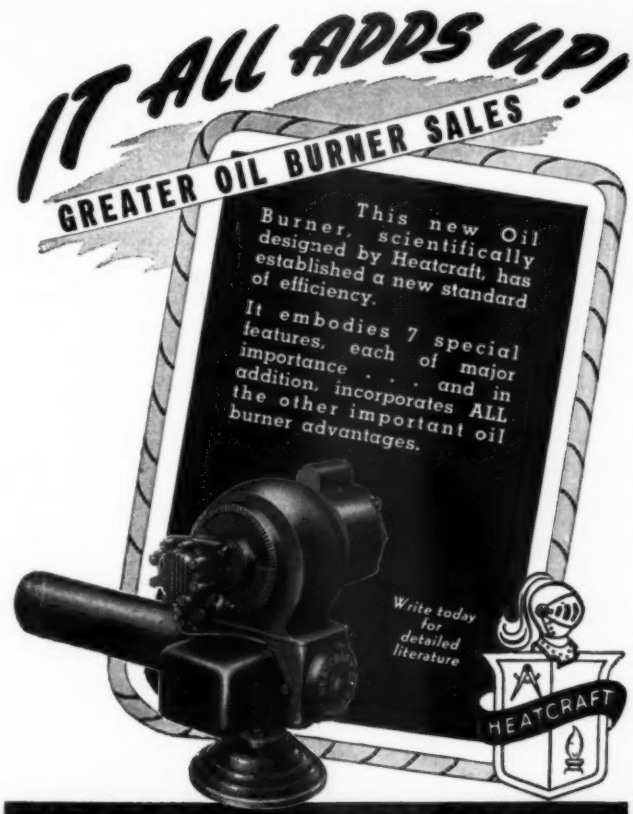


DON'T blame the cave man. He didn't know about Rotary Concrete Drill Bits. This modern method of drilling holes in concrete does the job fast, quiet and easy. Rotary Bits give precision holes not deflected by hard rocks. Of course they cost more, but by golly they're worth it! Machine tooled! Fluted to carry off chips! Three or more cutting surfaces! Resharpened free. Special designs and sizes on order.

Rotary Concrete Drill Co.

650 South Arroyo Parkway

PASADENA 2, CALIFORNIA


IT ALL ADDS UP!
GREATER OIL BURNER SALES
This new Oil Burner, scientifically designed by Heatcraft, has established a new standard of efficiency.
It embodies 7 special features, each of major importance . . . and in addition, incorporates ALL the other important oil burner advantages.
Write today for detailed literature
HEATCRAFT

HEATCRAFT COMPANY
VAUGHAN BLDG., LOUISVILLE, KENTUCKY

AJAX

FURNACE PIPE and FITTINGS

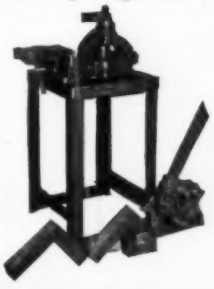
for Forced Air and Air Conditioning Installations

- The quality of "AJAX" Fittings is fully guaranteed.
- Scientifically designed to reduce air friction.
- Double seamed to add strength, durability and air-tight construction.
- Made of high-grade full gauge sheets. No seconds used.
- Every order, large or small, receives personal attention.
- Our engineering department is at your service and will gladly help you solve your heating problems.

AJAX FURNACE FITTING CO.
Division of
THE CINCINNATI SHEET METAL & ROOFING CO.
216-20 E. FRONT ST., CINCINNATI, OHIO

WHITNEY-JENSEN PRODUCTS
30 YEARS EXPERIENCE

COMBINATION ROLLER BEARING BENDING BRAKES
Working Lengths—4'-5'-6'-8'-10' Capacities—16-14-12 ga.



NO. 455 ANGLE IRON COMBINATION
Consists of No. 4 Shear, No. 50 Notcher, No. 51 Bender—mounted on stand.

CAPACITY
Will cut, notch, and bend all sizes of angle iron through 2" x 2" x ¼".
Weight—225 lbs.

Write for New Catalog

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

IT PAYS EVERYONE TO CHANGE TO DETROIT AIR FILTERS

For your customers, Detroit Air Filters mean . . .

- Low maintenance cost
- Maximum dust-collecting efficiency
- Minimum air resistance
- Greater dust-carrying capacity
- More uniform performance
- Greater economy and long life

Sold only through the warm air heating, ventilating and refrigeration trades, Detroit Air Filters are recognized as dependable products that mean more profits for you. Write for illustrated booklet.

DETROIT AIR FILTER COMPANY
1228 West Kinzie Street, Chicago 22, Illinois

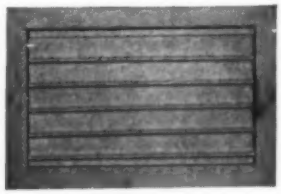
BETTER DELIVERY **VICTORY REGISTER** MODERATELY PRICED

(STYLE V)

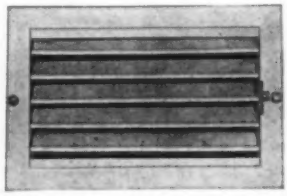
A ONE-PIECE REGISTER OF STURDY CONSTRUCTION

PERFORMANCE

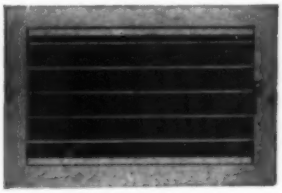
Up-Down deflection as required for "Good Practice" rating by "YARDSTICK", published by National Warm Air Heating and Air Conditioning Association.



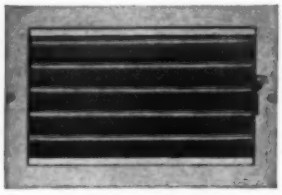
CLOSED



DOWN DEFLECTION



STRAIGHT



UP DEFLECTION

Write for Catalog #12 showing all types of Air Conditioning Registers and Grilles.

REGISTER & GRILLE MANUFACTURING CO., Inc.
66 BERRY STREET BROOKLYN 11, N. Y.

Kruckman— Washington Letter

(Continued from Page 61)

steel have been so loose that there was practically no restriction. Theoretically, the shipper worked under what was known as a consolidated license. This permit, valid for a year, put forth a broad volume the holder might ship, but imposed no restrictions as to place or end-use. Technically, the shipper was assumed never to exceed his quota by more than 10%; actually it is known many holders of licenses consistently violated the quota limitations. Violations were easy because the shippers never were obliged to exhibit their consolidated licenses to the Collector of Customs. They merely reported the identifying number of their license. The regulation was so vague that the Department of Commerce could not check the volume sent out under a specific permit. It is known that some exporters exceeded their quotas by 400 to 500%.

Details of New System

The new system, effective October 1st, requires that each shipper must apply for a specific license or permit for each single shipment. It is regarded as certain that the restriction will reduce export of steel materially. It is anticipated it will take steel into the countries where it is required for rehabilitation, where-

For Fast, Easy Cutting

BREMIL PORTABLE SHEARS

All-Alloy BLADES BOLTS LEVERS

On the Job • In the Shop

ALL-ALLOY No. 2 cuts up to ¼" steel plate.

ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.

Your work will proceed faster and neater when you use Bremil All-Alloy Portable Shears on the job or in the shop.

LONG-LIFE BLADES—removable cutting blades are made from finest grade ALLOY (Shear Blade) Steel which has been properly heat treated, accurately machined and surface ground. Special blades available for cutting stainless steel.

WRITE TODAY FOR DESCRIPTIVE LITERATURE

BREMIL MANUFACTURING CO.
1800 Pittsburgh Avenue ERIE, PA.

A PLIER • A WRENCH • A HANDVISE

Ideal Clamps for Sheets & Templates
SNAP ON-SNAP OFF!
TERRIFIC TOGGLE ACTION GRIP

SQUEEZE handles together, then let go; holds like a vise but easily releases by spreading the handles. Parallel grip. Bottom jaw swiveled to grip off shapes—*only tool of its kind with this feature!*

Excellent bolt or pipe wrench. Fine for holding work to be ground, filed or drilled. Body of heavy pressed steel, and welded jaws of hardened tool steel. Two sizes: No. 1610, 10"; No. 1607, 7". At dealers only.

SEYMOUR SMITH & SON, INC., 901D MAIN ST., OAKVILLE, CONN

Northwestern

Presents a New Catalog

Here's further evidence of our sincere desire to furnish the finest possible service in filling your orders for repair parts. It's a big, new 85 page catalog listing the thousands of patterns available, and which you may combine with our price list to estimate the cost to you of the many parts listed. It will be an invaluable aid in estimating the cost of jobs, as well as finding parts for heating plants whether new or old. This catalog is yours for the asking, too! Just drop us a line and we'll send one without delay.

Remember to try NORTHWESTERN FIRST and ALWAYS and you'll go a long way toward satisfying your customers.

NORTHWESTERN STOVE REPAIR COMPANY
662 WEST ROOSEVELT ROAD CHICAGO, ILLINOIS

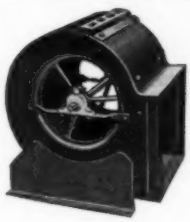
You Know at a Glance!

Write for complete details.

No guessing with AT-A-GLANCE. You know too, that they are guaranteed leak-proof — are "tailor-made" to fit all tank sizes and shapes — are sturdily built to withstand excessive pressure, and are fully Underwriter listed.

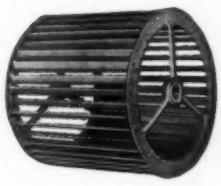
KRUEGER *Sentry* GAUGES
GREEN BAY • WISCONSIN

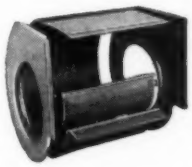
• BLOWERS •
for
Air Conditioning Furnace Manufacturers



The *New* Bishop & Babcock Air Conditioning Blower Assembly Type "AC"—Design 2

The *New* Bishop & Babcock Blower Wheel For Air Conditioning Furnace Blowers



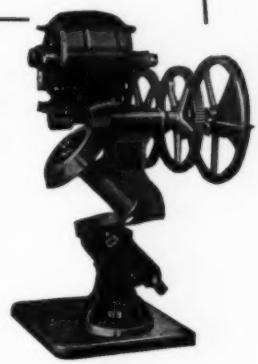


The *New* Bishop & Babcock All Stamped Housing Assembly and Component Parts

Write for Bulletin No. 103

MASSACHUSETTS BLOWER DIVISION
The BISHOP & BABCOCK *Mfg. Co.*
8901 HAMILTON AVENUE CLEVELAND 14, OHIO

Does Every Cutting Job
BETTER . . .
EASIER . . .
QUICKER . . .



No matter what type of cutting—either irregular shapes or straight splitting—from ANY width sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.

Furnished in hand operated or motorized models.

Get Special Shear Bulletin Today. Gives details of sizes from 18 gauge to one-quarter inch capacity.

MARSHALLTOWN MFG. COMPANY
920 E. Nevada Street, Marshalltown, Iowa

STEEL BLAST GATES

Write for full Particulars

AVAILABLE IN QUANTITY
MODERN PRESSED STEEL
BLAST GATES

When writing, ask for Bulletin No. 35

Rees Blow Pipe Mfg. Co.

340 SEVENTH STREET SAN FRANCISCO 3, CALIF.

NOW IN PRODUCTION!
PROMPT DELIVERY

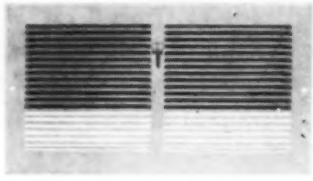
STANDFORATED
PERFORATION OF ALL METALS

"BEND - EZY"
FORCED AIR REGISTERS and GRILLES
FOR SIDEWALL AND BASEBOARD INSTALLATION

Immediate Shipment on these sizes:

8 x 6 — 10 x 6
12 x 6 — 14 x 6

SPECIAL SIZE: Made to Order.



Can also supply 24 x 6 and 30 x 6 Intakes to match. Quick delivery on other size registers and intakes.

PERFORATED METALS FOR EVERY INDUSTRIAL USE

Write for Complete Information and Price List

STANDARD STAMPING & PERFORATING CO.
3137 W. 49th PLACE · CHICAGO ILLINOIS

as countries, such as Canada and the Latin American countries, will not be able to qualify to the extent which has enabled them to obtain relatively large quantities. The new system is expected especially to stop the shipment of larger volumes of steel which have been going to Russia, and to the satellite nations of the Soviets. It is reported this group have been actually the heaviest beneficiaries of the enormous export of steel the past two years.

The major officials of the steel industry in the Senate Small Business Committee hearings repeatedly and consistently asserted the supply of steel for the domestic market would be in balance, and sufficient, within two years, or less.

Taft-Hartley Law Defined

The Taft-Hartley Labor Law is tersely defined thus, in Washington discussions: It furnishes protection to the individual who does *not* wish to join a union; it outlaws the secondary strike and most sympathetic strikes; it tries to place employers and unions on an equal footing before the National Labor Relations Board, and comparably, before the courts; it makes the unions subject to suit for unfair practices, for breaches of contracts, and for illegal activities, and compels them to open their books; and it returns to the States some of their former authority over unions within their own borders. Foremen or supervisors are specifically exempted from the definition of "employee." They do not come under the terms of the law, but are not prevented from forming unions. It is generally pointed out under the Taft-Hartley Law the

Profits!
Through the
SUPER-THERM
Combination
OIL BURNER

SALES PROSPECTS for this modernizing, easily installed oil burner are *all* owners of wood and coal stoves and ranges. Super-Therm fits any size stove, front or rear—will last a lifetime—will not soot or smoke—has automatic safety features. Write now for details and *dealer profit* facts.

THERM OIL BURNER CO.
Pioneers of the Oil Burning Industry
2105-D WESTLAKE AVE. SEATTLE 1, WASH.

Lower Priced and More Durable!

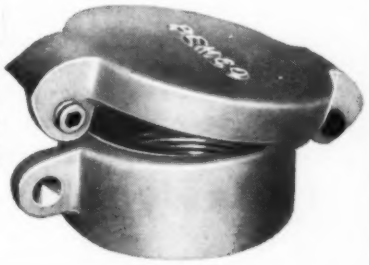
PEMCO Storage Tank Fittings

Tamper-Proof Aluminum FILL BOX

With 3/8" Allen Socket Set Screw

This hinge type Fill Box does not require a lock. Made of specially treated cast aluminum, it can't break. Available in 2" size only. Allen keys supplied extra.

Figure 71 AK



New Design SLIP-ON VENT CAPS. Has 10-24 Allen Socket Set Screw and larger venting area. Made of cast aluminum. Fits standard pipes with or without threads, from 3/4" to 2". Complete with screens. Allen Keys extra.

Hinge-Type FILL BOX. Lock-type style. Made of cast aluminum. Hinge and vented, can be easily locked. In 2" size only.

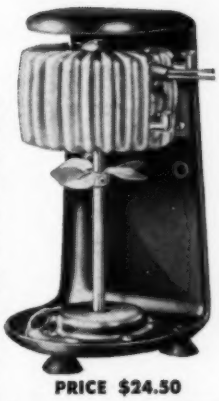
Export Dep't.: 44 Whitehall St., N. Y., U. S. A.
Canada: Industrial Spec. Co., Weston, Ont.
Buy from Your Jobber or Write Direct

CONTACT YOUR *PEMCO* DISTRIBUTOR
You'll find him co-operative in filling your order and supplying you with technical data.

PEMCO
PETROLEUM EQUIPMENT MFG. CO.
75 Brewster St., New Haven, Conn.

Morey Products
SPELL BIGGER PROFITS FOR YOU IN 1947

RECIRCULATING PUMP



PRICE $24.50

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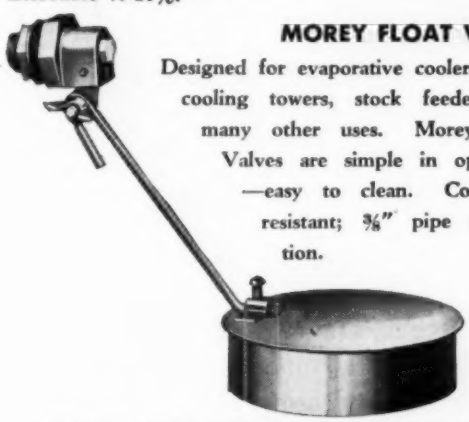

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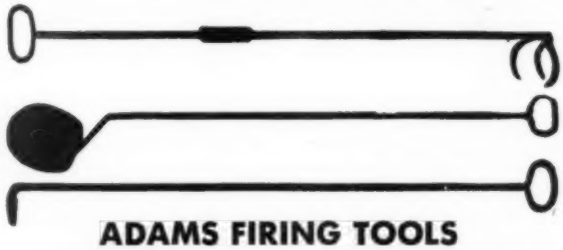

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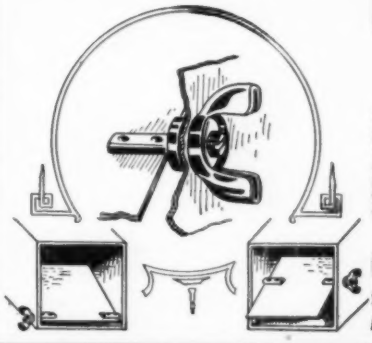

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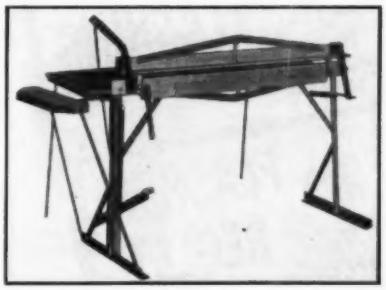

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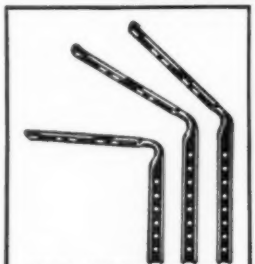

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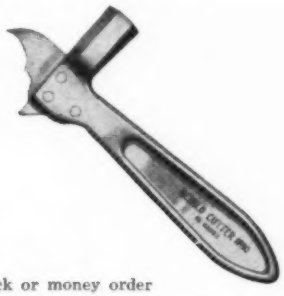

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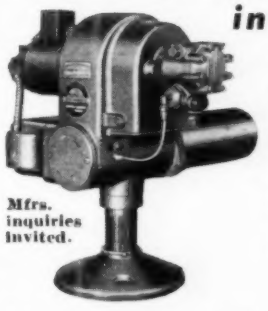

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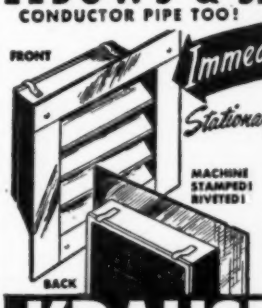

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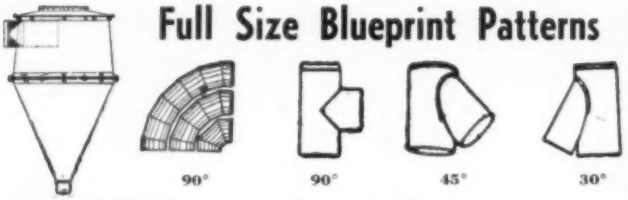

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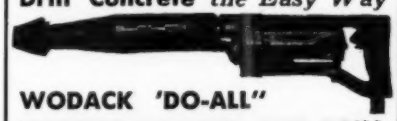

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BRAKES	PRESSES
BENDERS	NOTCHERS
FORMERS	WELDERS

SHEET METAL MACHINERY

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•MOTOR OPERATION

TEMPSCRIBE Recorders are accurate, rugged, dependable instruments at an amazingly low cost. Temperature Recorder makes round-the-clock records showing highest and lowest temperature and frequency of temperature fluctuations. Operation Recorder records motor-on-and-off time, cycling frequency, and total running time during test period. A unique feature of each TEMPSCRIBE Recorder is its convertibility from one temperature range to another, or from temperature recorder to operation recorder or the reverse merely by changing the door.

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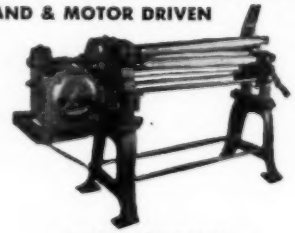
HAND & MOTOR DRIVEN



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Burring—Turning—Wiring & Beading Rolls

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24" Bed & Ram—12" Throat—14 Ga. Cap.
Motor Driven

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Copy for insertion in this section must be received by the twenty-fifth of month preceding issue. One-inch minimum space accepted.

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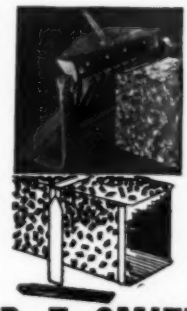
SAVES MORE TIME per joint of pipe, over ordinary hand methods, than any other machine used on square pipe work . . . and it is USABLE MORE OFTEN per job, because it edges the pipe and makes drive cleats to join them together.



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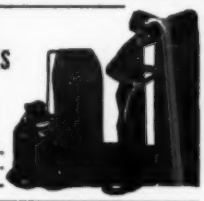

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SLIP ROLLS—ROTARY MACHINES
PITTSBURGH LOCK MACHINES
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POWER PRESSES—FOOT PRESSES
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NEW NO. 1A ROUSSELLE FLOOR: 10 ton cap.; 2" stroke.....$342.15

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NO. 7 & NO. 8 LONG & ALSTATTER DOUBLE END PUNCHES

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48" BRADDOCK (LAMB & NASH)
44" BLISS: 22 ga. cap.
33" UTICA GANG SLITTER
28" GANG SLITTER, 3" Dia. Shaft

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12' 10 GA. GEORGE OHL SQUARE.
10' 3/16" OHL SQUARE.
10' 3/16" BERTSCH SQUARE.
8' 3/16" OHL SQUARE, MTR.
8' x 14" GA. BERTSCH SQUARE.
NO. 6 HILLES & JONES, 1" CAP., 27" GAP.
NO. 252 NIAGARA: 52" x 14 ga. cap.
48" OHL POWER: 14 ga.
NO. 236 NIA. 36", 14 ga.
5' CLEVE, ½" CAP. 25" GAP.
NO. 2A QUICKWORK ROTARY: 14 ga. cap.
NO. 141 QUICKWORK ROTARY: 14 ga. cap.
NO. 105 BLISS CIRCLE: 16 ga. cap.
12—NEW No. 299 PEXTO HAND POWER RING and CIRCLE: 20 ga. cap. and lighter Each $189.50
No. 138-M LENNOX THROATLESS: Cap. ⅜" mild steel; M.D.

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NEW NO. 18-52 FAMCO.....$407.50
NEW NO. 18-42 FAMCO.....$325.25
NEW NO. 18-36 FAMCO.....$244.00
NEW MODEL 137 PEXTO:
36"x18 ga. cap.; with hold-down.....$252.00
NEW NO. 1836 FRECUT.....$247.50

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NEW NO. 416E PEXTO HAND POWER SLIP ROLLS 36" x 14 ga. cap. OUR SPECIAL PRICE ea. $290.00
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10' PYRAMID, D.B.G., B.D.
LATE TYPE 10' BERTSCH; ½" CAP.
LATE TYPE 6 FT. NIA.; M.D.
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48" BERTSCH INITIAL TYPE: D.B.G., M.D.

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LATE TYPE NO. 50 KANE & ROACH PINCH TYPE BENDER

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NEW NO. 6 CERWECO: 6' 14 ga. cap.
NEW NO. 8 CERWECO: 8' 14 ga. cap.
CHICAGO STEEL POWER APRON BRAKES: 12¼", 10' ¼"
10' 3/16" WHITING PRESS BRAKE: M.D.
8' 10 GA. GEORGE OHL PRESS BRAKE.

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